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F. MANSON BAILEY, F.L.S.

COLONIAL BOTANIST OF QUEENSLAND.

WITH PLATES ILLUSTRATING SOME RARE SPECIES.

PART VI.

ALISMACEÆ TO FILICES.



PUBLISHED UNDER THE AUTHORITY OF THE QUEENSLAND
GOVERNMENT.

QUEENSLAND
PRINTED BY H. J. DIDDAMS & CO., ADELAIDE STREET, BRISBANE.

1902

Price: Five Shillings.



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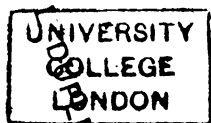
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PREFACE TO PART VI.

It is customary in the concluding volume, or part of publications like the present, to take the opportunity of making a few remarks with regard to features of the work which may seem to require explanation.

It was my intention to have given in this Part a general index of the whole work, but as the pages have far exceeded in number what I at first anticipated, I thought it better, under the circumstances, to dispense with this very useful feature.

The additions comprise all those plants which came to our knowledge too late for inserting in their proper places during the three years the work has been in process; and also references to plates given in the first two volumes of Mr. James Britten's excellent "Illustrated Botany of Captain Cook's First Voyage." This work having been commenced after the Queensland Flora, references to the plates could not be made in the proper places, and not to have referred to them would have been a loss to the Flora. It will be noticed that in a few instances I have deviated from the nomenclature of the *Genera Plantarum* of Bentham and Hooker, but in doing this I have only followed Sir J. D. Hooker's later work, the "Flora of British India." However, even in this I have not adopted any change which, in my opinion, would be confusing to persons using the "Flora" and other works on the plants of Queensland.

Although where information has been obtained, either from persons or publications, it will be found duly acknowledged, I feel it due to Dr. W. E. Roth, the northern Protector of Aborigines, to express my special thanks for the very great trouble he has taken to furnish me with authentic information regarding the aboriginal names and uses of so many of the northern plants; thus adding to the present work a feature not to be found in any previous publication on the Australian plants. To the numerous] other persons who have furnished me with similar information I have also to express my gratitude; the notes, however, in many instances, have been much abbreviated.

In conclusion, I must acknowledge the loyal help which my son has rendered me during the progress of the work. For all errors and imperfections I crave the indulgence of all who may refer to the work for information regarding the Queensland plants.

F.M.B.

1st DECEMBER, 1902.

DATES OF PUBLICATIONS.

PART IV.	September, 1901
PART V.	April, 1902
PART VI.	December, 1902

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THE QUEENSLAND FLORA.

CLASS III. MONOCOTYLEDONS.

SERIES VI. APOCARPÆ.—1 to 2-seriate or wanting. Ovary superior, of one or more distinct 1 or more ovulate carpels. Seed exalbuminous.

CXLVII. ALISMACEÆ. Flowers hermaphrodite, monœcious or diœcious. Perianth regular, segments 6, 2-seriate, the outer herbaceous inner membranous. Aquatic or marsh plants, leaves most frequently radical. Embryo complicate-hippocrepic.

CXLVIII. NAIADACEÆ. Flowers monœcious, diœcious or hermaphrodite. Perianth regular, segments 2, 3, 4, or 6, herbaceous or wanting. Aquatic or rarely marsh plants, leaves various. Embryo macropodous.

SERIES VII. GLUMACEÆ.—Flowers sessile within imbricate bracts or glumes, in heads or spikelets. Perianth none or scarious or glume-like and usually concealed within the bracts. Ovary 1-ovulate or with 1-ovulate cells. Seeds albuminous.

CXLIX. ERIOCAULÆÆ. Flowers unisexual in head, usually androgynous. Perianth segments 6 or fewer, small and scarious or hyaline. Ovary 3 or 2-celled; ovules pendulous.

CL. CENTROLEPIDÆÆ. Flowers hermaphrodite or polygamous. No perianth. Stamen 1. Ovary of 1 or 2 or more cells; ovule pendulous. Small tufted plants.

CLI. RESTIACEÆ. Flowers usually unisexual. Perianth of 6 rarely fewer, glume-like segments usually exceeding the bracts. Stamens 3. Ovary 1, 2 or 3-celled; ovule pendulous. Habit that of the rushes and sedges. Leaf sheaths with free margins.

CLII. CYPERACEÆ. Flowers hermaphrodite or unisexual. Perianth none or of small scales or bristles concealed within the bracts, very rarely of 6 glume-like segments. Stamens various. Ovary 1-celled; ovule erect. Leaf sheaths with the margins connate.

CLIII. GRAMINEÆ. Flowers hermaphrodite or unisexual. Perianth none. Stamens various. Style-branches usually feathery. Ovary 1-celled, ovule erect. Leaf-sheaths with free margins.

CLASS IV. ACOTYLEDONS.

No real flowers. Fructification in the Orders mentioned consisting of spore cases enclosing spores.

CLIV. LYCOPODIACEÆ. Spore-cases sessile in the axils of radical or cauline leaves or bracts.

CLV. MARSIACEÆ. No true leaves. Fronds circinnate in vernation; barren ones linear or with a leaf-like lamina, fertile ones forming an urticule or closed involucre including the spore cases.

CLVI. FILICES. No true leaves. Fronds circinnate in vernation (except in *Ophioglosseæ*), the fertile ones bearing the spore-cases on their under surface or margins.

PART VI. B

ORDER CXLVII. ALISMACEÆ.

Flowers hermaphrodite or unisexual, regular. Perianth when perfect of 6 segments, imbricate in 2 series, the 3 outer ones membranous or herbaceous, the 3 inner larger and petal-like, often very fugacious. Stamens 6, 9 or indefinite, hypogynous or slightly connected with the base of the segments, but when isomerous with them not usually opposite their centres; filaments filiform or flattened; anthers erect, with 2 parallel cells opening laterally in longitudinal slits. Ovary of 3, 6 or many carpels, quite distinct or shortly connate, each tapering into a short style or with a sessile terminal stigma; ovules 1, 2 or few, erect from the base of the cavity, or the funicle of the inner one shortly adnate to the inner angle, or numerous and parietal. In fruit the carpels ripen into indehiscent nutlets, or when several-seeded are variously dehiscent. Seeds erect or when several ascending or spreading, with a thin testa and inner membrane; no albumen. Embryo either straight and of the shape of the seed, or more frequently horse-shoe shaped; radicle inferior.—Marsh or water plants. Leaves radical on long petioles. Flowering stems leafless, or rarely, in species not Australian, leafy. Flowers in terminal umbels, racemes and panicles.

The Order is represented in the marshes, ponds, and shallow waters of most parts of the globe.

TRIBE I. **Alismæ.**—Fruit of 3 or more achenes.

Perianth perfect. Flowers pedicellate, paniculate, umbellate or almost racemose.

Carpels 1-seeded, indehiscent, scarcely beaked 1. **ALISMA.**

Carpels 2-seeded, tapering into divaricate beaks falling off by a transverse rupture near the base 2. **DAMASONIUM.**

TRIBE II. **Butomæ.**—Fruit of follicles.

Carpels many-seeded, dehiscent along the inner suture 3. **BUTOMOPSIS.**

1. **ALISMA**, Linn.

(Derived from the Celtic word for water.)

Flowers usually hermaphrodite. Perianth of 6 segments, 3 outer ones membranous or almost herbaceous, 3 inner large and petal-like. Stamens 6. Ovules solitary in each carpel. Fruit-carpels indehiscent, either about 6 or numerous, arranged in a ring round the depressed axis, or (in species not Australian separated by some into a distinct genus) irregularly crowded in a globular head. Seed ovate or oblong with a horse-shoe embryo.—Aquatic herbs, erect or in species not Australian floating, with radical leaves on long petioles. Flowers either in a terminal umbel with or without whorls of pedicellate flowers below it, or in a panicle with whorled branches, each bearing a similar umbel.

The genus is widely spread over the temperate and warm regions of the globe.

Carpels 6 or fewer, rarely 7 or 8.

Leaves deeply cordate with a narrow sinus, the outer primary veins on each side confluent in the auricles, transverse veinlets not very close and more or less connected by reticulations.

Carpels about 3 lines long, hard, often muricate 1. **A. acanthocarpum.**

Carpels under 2 lines long, smooth or tuberculate, the pericarp not very hard 2. **A. oligococcum.**

Leaves broadly cordate or reniform, the primary veins all distinct, transverse veinlets very numerous and closely parallel. Carpels somewhat drupaceous 3. **A. reniforme.**

1. **A. acanthocarpum** (fruit spiny), *F. v. M. Fragm.* i. 28, viii. 214; *Benth. Fl. Austr.* vii. 185. Leaves broadly ovate or orbicular, deeply cordate with a narrow sinus and angular auricles, glandular-dotted, with 11 to 17 primary nerves, the outer ones on each side confluent within the margin of the auricles, the transverse veinlets not very close and often connected by reticulations. Panicle usually 6 to 9 in. long and broad, the branches and pedicels 3 or

4 in each whorl, the bracts under the whorls more herbaceous than in other species, the lowest often above 1 in. long and shortly connate at the base. Outer perianth-segments ovate, striate, persistent, about 1 line long; inner ones twice as large, of a pale pink, very fugaceous. Fruit-carpels usually 6 or fewer but sometimes 7 or 8, the largest of the genus, being about 3 lines long when ripe, the pericarp hard and rather thick, with 3 or 4 dorsal ribs more or less muricate, 2 or more of the prickles often conical and very prominent.

Hab.: Gulf of Carpentaria, *Gulliver*; Rockingham Bay, *Dallachy*; Mount Elliott, *Fitzalan*.

2. ***A. oligococcum*** (fruits few). *F. v. M. Fragm.* i. 23, viii. 214; *Benth. Fl. Austr.* vii. 185. Closely allied to *A. acanthocarpum*. Leaves the same, with the same narrow basal sinus glandular dots and almost pedate venation. Flowers also similar, in a broad panicle with the lower bracts leafy, but smaller or more slender than in that species. Carpels usually only 2 or 3 perfect $1\frac{1}{2}$ or rarely 2 lines long; very obtuse, the 3 or 4 prominent dorsal ribs smooth or tuberculate but not muricate.—*A. glandulosum*, *Thw. Enum. Pl. Zeyl.* 332.

Hab.: Moreton Bay, *W. Hill, F. v. Mueller*; Herbert's Creek and Gainaford, *Bowman*; Rockingham Bay, *Dallachy*; also in Ceylon and East India.

3. ***A. reniforme*** (kidney form), *Don. Prod. Fl. Nep.* 22; *Benth. Fl. Austr.* vii. 186. Leaves orbicular-cordate or reniform, $1\frac{1}{2}$ to 4 in. long and often broader than long, very obtuse, with 13 to 17, usually 15 primary nerves, the transverse veinlets very numerous fine and closely parallel. Panicle very large, with long verticillate branches not numerous in each whorl. Outer perianth-segments nearly orbicular, many-nerved, about 2 lines long. Carpels 6 or fewer, rarely 7 or 8, thick and more or less drupaceous, with several usually 7 or 9 dorsal ribs not tuberculate, the style rather slender, adnate to the inner edge to near the summit.—*Wight, Ic.* t. 322.

Hab.: Burnett River, *F. v. Mueller*; Rockhampton, *O'Shancey*; Rockingham Bay, *Dallachy*. The species is also common in many parts of East India.

2. DAMASONIUM, Juss.

(From supposed medicinal qualities.)

(*Actinocarpus*, *R. Br.*.)

Flowers hermaphrodite. Perianth of 6 segments, 3 outer ones membranous, 3 inner larger and petal-like and very fugacious. Stamens 6. Ovules 2 in each carpel. Fruit carpels 6 to 9 or rarely more, laterally flattened, adnate by their broad base to the convex or conical receptacle, tapering into a beak, spreading, when ripe usually breaking off transversely near the base. Seeds 2 or solitary by abortion. Embryo horse-shoe shaped.—Aquatic or marsh herbs, with the habit of the annual *Alismas*.

Besides the Australian species which is endemic, the genus comprises a few others from the northern hemisphere, all are closely allied to each other and possibly varieties of one.

1. ***D. australe*** (Australian), *Salisb.; Kunth. Enum.* iii. 155; *Benth. Fl. Austr.* vii. 186. A tufted glabrous annual. Leaves all radical, on long petioles, from ovate-cordate to lanceolate, 1 to 2 in. long with 3 or 5 primary nerves connected by several rather distant transverse veins and these again by numerous cross parallel veinlets. Stems leafless, 6 in. to 1 ft. high, flowering from about the middle, with verticillate branches either all 1-flowered and $\frac{1}{2}$ to 1 in. long, or some of them elongated bearing an umbel of 5 to 10 flowers. Outer perianth-segments scarcely above $\frac{1}{2}$ line long; inner ones rather larger but exceedingly fugacious. Carpels usually about 9, but varying from 5 to 10, breaking off when ripe by a transverse somewhat curved line, usually dropping the lower seed

and carrying off the upper one with it. Seeds oblong, tuberculate.—F. v. M. Fragm. viii. 215; *Actinocarpus minor*, R. Br. Prod. 848; *Alisma minus*, Spreng. Syst. ii. 163.

Hab.: Herbert's Creek, Bowman; North Queensland, Armit; Tambourine Mt., Rev. B. Scortechini.

3. BUTOMOPSIS, Kunth.

(Butomus-like.)

(*Tenagocharis*, Hochst.)

Flowers hermaphrodite. Perianth of 6 segments, 3 outer ones thinly membranous, reticulate, 3 inner rather larger, petal-like but very thin and transparent, fugacious. Stamens 8 or 9. Ovules numerous in each carpel. Fruit-carpels 6 or sometimes 7, slightly cohering at the base, and adnate to the flat receptacle, tapering into short spreading beaks, opening along the ventral suture. Seeds very numerous. Embryo horse-shoe shaped.—Semi-aquatic or marsh plant, with radical leaves on long petioles. Flowers on long pedicels, in a simple terminal umbel.

The genus is limited to a single species spread over tropical Asia and Africa.

1. **B. lanceolata** (lance-shaped), Kunth, Enum. iii. 165; Benth. Fl. Austr. vii. 187. Leaves oblong-lanceolate or elliptical, acute or obtuse, usually attaining the length of the scape including the long petiole. Scape 4 to 8 in. high under the umbel, which consists of from 3 to above 20 pedicels $1\frac{1}{2}$ to 4 in. long when in fruit, surrounded by a few thin scarious bracts. Outer perianth-segments ovate or nearly orbicular, 2 to $2\frac{1}{2}$ lines diameter when in flower, persistent and sometimes rather larger under the fruit; inner segments rather larger and very deciduous. Ripe carpels shortly exceeding the perianth. Seeds smooth and shining, scarcely more than $\frac{1}{4}$ line long.—*Butomus lanceolatus*, Roxb. Fl. Ind. ii. 315; Royle, Illustr. Him. Bot. t. 95; *Tenagocharis cordofana*, Hochst. in Flora, 1841, 369; F. v. M. Fragm. x. 104.

Hab.: Lagoons on Gilbert River, Armit.

ORDER CXLVIII. NAIADÆ.

Flowers hermaphrodite or unisexual, regular or very imperfect. Perianth of 6, 4 or 3 small scale-like segments or rudimentary or none. Stamens 6 or fewer; anthers erect, sessile or nearly so at the base of the segments or on the receptacle, usually 2-celled, opening outwards in longitudinal slits. Ovary of 6 or fewer carpels, distinct or rarely more or less connate or solitary, tapering into distinct entire or branched styles or with sessile stigmas; ovules 1 or rarely several in each cell, laterally attached at or above or rarely below the middle. Fruit of 6 or fewer or single indehiscent nutlets, or rarely follicular carpels opening inwards in a longitudinal slit. Seed attached at or below the summit, straight curved or more or less coiled, with a thin testa and no albumen. Embryo the shape of the seed or more coiled or hooked at the upper cotyledonous end, the plumula frequently prominent from a dorsal cavity.—Aquatic floating or submerged plants or rarely erect marsh herbs with radical leaves. Flowers small, usually green, in spikes heads or solitary, on axillary peduncles or radical scapes, or entirely enclosed in the sheathing bases of floral leaves or bracts.

The Order, like *Alismaceæ*, is represented in the marshes, ponds, and shallow waters of most parts of the world, and includes some exclusively marine genera as widely dispersed. The deficiency or very reduced state of the perianth and sessile anthers opening outwards readily distinguish the Order from *Alismaceæ*, which are otherwise its nearest allies.

TRIBE I. **Juncagineæ**.—Flowers spicate or racemose, hermaphrodite or unisexual. Perianth (very rarely wanting) segments 6, 2-seriate, herbaceous. Stamens 6, rarely only 1. Ovary of 3 or more carpels, 1 to 2 ovulate, ovule basal erect, anatropous.

Flowers hermaphrodite, ebracteate. Perianth-segments 3 or 6. Stamens 6, inserted on the base of segments. Carpels 3 to 6, 1-ovulate 1. *TRIGLOCHIN*.

TRIBE II. *Aponogetonæ*.—Flowers spicate, hermaphrodite, bracts often white. Perianth none or the segments and bracts 1 to 3, coloured. Stamens 6 or more hypogynous. Carpels 3-5, 3 many-ovulate, ovules basal or subbasal.

Flowers sessile in a simple or once forked spike 2. *APONOGETON*.

TRIBE III. *Potamogetonæ*.—Flowers spicate, hermaphrodite. Perianth none or segments 4 herbaceous. Stamens 2 or 4 inserted on the base of the segments. Carpels 4, 1-ovulate, ovule pendulous below the apex or inserted on the ventral suture of the cell, campylotropous.

Flowers 4-merous. Carpels free 3. *POTAMOGETON*.
Fruiting carpels on long stalks, at first sessile 4. *RUPPIA*.

TRIBE IV. *Zosteræ*.—Flowers unisexual, on a complanate second spadix. Perianth none. Male flowers with sessile 1-celled anthers, pollen conserved. Female flowers; carpel solitary, sessile with 1 pendulous ovule,

Flowers monœcious. Carpel ovoid 5. *ZOSTERA*.

TRIBE V. *Naiadæ*.—Flowers unisexual, axillary. Perianth hyaline. Male flower with 1 sessile or 2 connate anthers, pollen globose. Female flowers; carpel solitary, 1-ovulate, ovule basal, anatropous.

Carpels 1-seeded 6. *NAIAS*.

TRIBE VI. *Cymodocæ*.—Flowers unisexual, axillary. Perianth none. Male flowers of 2 sessile anthers more or less connate by their backs, with 2 parallel cells opening outwards in longitudinal slits, pollen conserved. Female flowers; carpels 2, 1-ovulate, ovule pendulous, orthotropous.

Anthers 2. Carpels 2 7. *CYMODOCÆA*.

1. *TRIGLOCHIN*, Linn.

(*Cyenogeton*, Endl. *Maundia*, F. v. M.)

Flowers hermaphrodite or rarely polygamous. Perianth-segments scale-like, 3, 6 or fewer. Stamens as many or fewer, inserted at the base of the segments and falling off with them; anthers sessile, broad, the cells opening outwards in longitudinal slits. Carpels normally 6, but 3 alternate ones sometimes reduced to empty laminæ, all more or less united in the axis at the time of flowering or distinct from the first, the short terminal styles or stigmas always distinct. Ovules solitary in each carpel, laterally attached below the middle. Fruit of 6 or 3 indehiscent deciduous 1-seeded nutlets, the 3 empty carpels of some species remaining attached to a central axis and assuming the appearance of dissepiments of a capsule. Seed erect, cylindrical or ovoid, the testa membranous; embryo straight, the shape of the seed.—Marsh or aquatic herbs. Leaves all in radical tufts, linear or filiform. Scapes erect, simple and leafless, bearing a terminal spike of small flowers sessile or shortly pedicellate, without bracts.

The genus is spread over a great part of the globe, but mostly in extratropical or subtropical regions.

SECT. I. *Eutriglochis*.—Fruits with 3 perfect deciduous nutlets, leaving a central axil with 3 thin barren carpels resembling dissepiments. Stamens usually 3 perfect or in the terminal flower 6.

Stock stoloniferous. Scape usually 3in. to nearly 1ft. high. Fruit nearly orbicular 1. *T. striata*.

Dwarf plants without stolones. Scape usually under 3in. high. Fruit narrow, the perfect carpels with an angle or short spur at the base 2. *T. centrocarpa*.

SECT. II. *Cyenogeton*.—Fruits with 3 to 6 perfect nutlets, without any barren ones or persistent axis. Stamens usually 6, rarely 4 or 5.

Scapes 1 to 3ft. high. Leaves long. Carpels 6, rarely 3, more or less united, at least when in flower or rarely free from the first 3. *T. procera*.

SECT. III. *Maundia*.—Fruits with 3 to 4 nutlets, cohering after flowering.

Scapes tall, with a sheath at the base. Leaves linear, spongy. Nutlets almost drupaceous 4. *T. Maundii*.

1. **T. striata** (channelled), Ruiz. et Pav. Fl. Per. et Chil. iii. 72; Benth. Fl. Austr. vii. 166. Rootstock small, stoloniferous. Leaves from narrow-linear and about 1 line broad to almost filiform, very variable in length but almost always shorter than the scape. Scape from 2 or 3 in. to nearly 1 ft. high, flowering from below the middle. Flowers shortly pedicellate, often very numerous. Outer perianth-segments broadly ovate, about $\frac{3}{4}$ line long, the inner ones smaller and narrower or almost wanting. Perfect anthers 8 at the base of the outer segments, those at the base of the inner segments fleshy and without pollen or deficient and some flowers occasionally without any anthers. Fruits orbicular or nearly so, 1 to $1\frac{1}{2}$ line long, with 6 prominent angles or ribs, 8 larger ones being perfect carpels, laterally compressed with 1 or 3 dorsal ribs and falling off at maturity, leaving 3 thin empty carpels united to the central axis and having then the appearance of the dissepiments of a 3-celled capsule.—F. v. M. Fragm. vi. 83; *T. decipiens*, R. Br. Prod. 348; *T. filifolium*, Sieb. in Spreng. Syst. Cur. Post. 142, also of Hook. Ic. Pl. t. 579; *T. triandrum*, Mich. Fl. Bor. Amer. i. 208, Hook. f. Fl. Tasm. ii. 40; *T. monteridense*, Spreng. Syst. ii. 145, Seub. in Mart. Fl. Bras. iii. part i. t. 12.

Hab.: Moreton Island, *M'Gillivray*; Brisbane River, *F. v. Mueller*.

The larger specimens with 3 prominent staminodia have usually broader leaves than the others.—*Benth.*

The species is widely spread over extratropical South America and is also in North America and in New Zealand.

2. **T. centropcarpa** (fruit spurred), Hook. Ic. Pl. t. 728; Benth. Fl. Austr. vii. 167. A dwarf slender plant usually densely tufted. Radical leaves subulate, often all under $\frac{1}{2}$ in. rarely rather above 1 in. long. Scapes usually 1 to 2 in. long, or in luxuriant specimens twice as much, very slender, bearing fruits from below the middle. Flowers minute, in a short dense inconspicuous spike, which soon elongates so as to occupy half the scape. Perianth-segments from broadly ovate-acute to lanceolate and acuminate, $\frac{1}{4}$ to $\frac{1}{2}$ line long, from scarcely exceeding to twice as long as the anthers, the lower flowers often with only 1 anther-bearing segment and 2 lateral empty ones, the others with 3 or rarely 6 segments, all anther-bearing, but the majority of the numerous specimens seen were in fruit with the perianth and stamens fallen away. Fruit linear, usually about 2 lines but varying from 1 to 3 lines long, with 3 perfect cells, truncate at the top and obtuse or more or less 3-toothed with the 3 stigmas, each perfect carpel 3-ribbed on the back, the lateral ribs with either a prominent angle or a tooth or spur at the base, the 3 barren carpels sometimes as thin as in *T. strigata*, sometimes as thick as the perfect ones but solid inside, and in some small specimens only one seed ripens in the whole fruit.—Hook. f. Fl. Tasm. ii. 40; Endl. in Pl. Preiss. ii. 54; *T. nanum*, F. v. M. in Trans. Vict. Inst. 1855, 185, and in Hook. Kew. Journ. viii. 332, Fragm. vi. 82.

Hab.: Queensland, *F. v. Mueller*.

The fruits in this species are exceedingly variable in size and position. In the rare form figured as above they are strictly erect, almost sessile and 2 lines long.

Var. *calcitrapa*. Fruits fully 3 lines long, the basal spurs 1 to $1\frac{1}{2}$ line to 2 lines long.—*T. calcitrapa*, Hook. Ic. Pl. t. 731. The figure quoted gives rather an exaggerated idea of the spur even of the single specimen drawn.—*Benth.*

Hab.: Queensland, *F. v. M.*

3. **T. procera** (tall), R. Br. Prod. 348; Benth. Fl. Austr. vii. 168. "Wanna," Cape Bedford, "Anamum," Musgrave River; Roth. Root-fibres swollen into ovoid or oblong tubers. Leaves from a terete base, linear, flat, $\frac{1}{4}$ to above $\frac{1}{2}$ in. broad, often several feet long when grown in deep water, the upper portion floating on the surface. Scapes 1 to several feet high, the terminal spike from 2 or 3 in. to above 1 ft. long. Flowers very numerous, nearly sessile. Perianth-segments 6 or rarely fewer, orbicular and $1\frac{1}{2}$ to 2 lines diameter, or narrower and not longer than the anthers. Carpels 6 or rarely fewer, united to

above the middle or sometimes at the base only, tapering into erect or recurved stigmas. Fruits exceedingly variable, from almost orbicular to narrow-oblong, 2 to 3 lines long, straight or spirally twisted, the carpels themselves straight or falcate.—Hook. f. *Fl. Tasm.* ii. 46; F. v. M. *Fragm.* vi. 83; *T. linearis*, Endl. in *Pl. Preiss.* ii. 54; *Cyenogeton Huegelii*, Endl. in *Ann. Wien. Mus.* ii. 211, *Iconogr. t.* 73, and in *Pl. Preiss.* ii. 55; *C. linearis*, Sond. in *Linnaea*, xxviii. 225.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*; Rockhampton and neighbourhood, *O'Shanesy*, *Bowman*; Brisbane River and many other localities, *Bailey*.

Tubers eaten baked.—*Roth*.

Var. *dubia*. Carpels 3, rarely 4 or 5, curved, apparently free from the first, often stipitate when in fruit.—*T. dubium*, *R. Br. Prod.* 343.—Cape River, *Bowman*; Rockingham Bay, *Dallachy*.

4. ***T. Maundii*** (after Dr. John Maund), *F. v. M. Fragm.* vi. 83; *Benth. Fl. Austr.* vii. 169. Roots thick with numerous small fibres. Stems creeping. Scape erect, terete, leafless, 2ft. high or more. Leaves long, linear, $\frac{1}{2}$ to 1 in. broad, the upper part thick and spongy, base sheathing. Spikes not dense, attaining 2 to 4 in. when in fruit, the flowers and fruits all sessile. Stamens 4 to 6, the anther-cells very distinct but adnate to a common connective as in the rest of the genus, the subtending perianth-segments sometimes thin, sometimes very broad and thickened at the apex. Carpels usually 2 or 3, sometimes 4, connate to the truncate apex, the stigmas broad and very spreading. Fruit about 3 lines long, cylindrical, but with 2 furrows on the back of each carpel, the carpels almost drupaceous, each with a thinly cartilaginous endocarp with an acute dorsal rib, the exocarp loose, rather thick, the 2 dorsal obtuse ribs often leaving cell-like cavities between them and the endocarp. Seed slender, cylindrical, erect.—*Maundia triglochinoides*, *F. v. M. Fragm.* i. 23.

Hab.: Still waters off Brisbane River, Moreton Bay, *F. v. Mueller*, *W. Hill*, *Bailey*.

2. APONOGETON, Thunb.

(From *apon*, the Celtic for water, and *geiton*, neighbour, alluding to the plants being aquatic.)

Flowers hermaphrodite. Perianth of 2 segments one on each side, small or in species not Australian petal-like. Stamens usually 6. Carpels of the ovary usually 3, with 2 to 6 ovules in each carpel all erect from the base. Seeds ovoid or oblong, erect. Embryo straight, with a more or less prominent plumula in a groove on the inner face.—Aquatic herbs with erect or floating or submerged leaves usually oblong or narrow. Scares leafless except a very deciduous membranous bract or spathe enclosing the young spike, but almost always fallen away before the flowering, leaving an annular scar. Flowers sessile in a terminal spike, simple in the Australian species.

The genus extends over tropical Asia and tropical and southern Africa.

Bulb-shaped rootstock covered with filamentous remains of leaf-sheaths and emitting roots from the base. Leaves under 6 in. long. Fruit-carpels tapering into a short recurved style 1. *A. monostachyus*.

Bulb-shaped rootstock with fewer filaments, emitting fibrous roots from the apex. Leaves above 6 in. long. Fruit-carpels obtuse with the rudimentary style almost lateral 2. *A. elongatus*.

1. ***A. monostachyus*** (spikes simple), *Linn. f. Suppl.* 214; *Benth. Fl. Austr.* vii. 188. "Kapabina," Bloomfield River, *Roth*. Rootstock thickened into a hard woody bulb-shaped tuber, covered with filamentous remains of old leaf-sheaths and emitting fibrous roots from the base or lower half. Leaves mostly submerged, oblong or lanceolate, obtuse or almost acuminate, cordate or rounded at the base, mostly 3 to 4 in. long and $\frac{1}{2}$ to $\frac{3}{4}$ in. broad, with 5, 7 or rarely only 3 longitudinal nerves. Spikes simple, usually dense, 2 to 2½ in. long, rarely longer more slender and interrupted. Spathe 2 or 3 lines long, falling off before the first flower expands. Perianth-segments from broadly lanceolate to obovate,

membranous, about $\frac{3}{4}$ line long. Stamens shortly exceeding the perianth. Fruiting carpels ovoid, tapering into a short recurved beak. Seeds 2 to 6, erect, narrow-oblong, the outer membrane loose and almost hyaline, the inner more opaque, darker coloured and closely appressed to the embryo. —Thunb. Nov. Gen. Pl. 78, with a figure; Roxb. Corom. Pl. t. 81; Andr. Bot. Rep. t. 406; *Spathium monostachyum*, Edgew. in Calcutta Journ. iii. 588, t. 16, corrected to *Aponogeton monostachyus* in Hook. Lond. Journ. iii. 404, t. 17.

Hab.: Gilbert River, *Gulliver*; Rockhampton, *Thozet*, *O'Shanesy*; Burdekin River, Herbert's Creek and Gainsford, *Bowman*. The species is widely spread over tropical Asia.

Roots eaten raw or baked.—*Roth*.

2. *A. elongatus* (lengthened), *F. v. M.* in *Herb. Hook.*; *Benth. Fl. Austr.* vii. 188. Tuberous rootstock formed below the uppermost fibrous roots. Leaves mostly submerged, very tender, from 6 in. to above 1 ft. long, and $\frac{1}{2}$ to $1\frac{1}{2}$ in. broad, contracted at the base or very rarely produced on one or both sides into a short basal auricle, with 5, 7 or 9 longitudinal nerves. Spikes simple as in *A. monostachyus* but more slender and the flowers not so close. Perianth and stamens as in that species. Carpels of the ovary very short with scarcely prominent styles and in fruit they are ovoid-globular, 2 to 3 lines long, very obtuse, with the very short remains of the style almost lateral. Seeds usually 3 or 4 in each carpel, narrow-oblong, the outer membrane not striate, the inner one exceedingly delicate. Embryo with a narrow groove, the small plumula at the base of the groove below the middle of the embryo.

Hab.: Brisbane River, *F. v. Mueller*; Maroochie River, *Bailey*.

3. POTAMOGETON, Linn.

(From *potamos*, a river; and *geiton*, a neighbour.)

Flowers hermaphrodite. Perianth-segments 4, scale-like, small, broad, contracted at the base or almost stipitate. Stamens 4, inserted at the base of the segments and falling off with them; anthers sessile, broad, the cells opening outwards in longitudinal slits. Carpels 4, distinct; styles short, terminal or the oblique stigmas sessile; ovules solitary in each carpel, laterally attached at or above the middle. Fruit of 4 nutlets or fewer by abortion, somewhat drupaceous, the exocarp membranous or slightly fleshy, the endocarp rather hard, crustaceous. Seed much incurved or horse-shoe shaped, round a clavate or obovoid projection of the endocarp; testa membranous. Embryo the shape of the seed.—Aquatic herbs with a perennial root-stock; stems submerged and floating usually forked and often rooting at the lower nodes. Leaves alternate or rarely opposite, wholly submerged or with a lamina floating on the surface, dilated at the base into membranous sheathing margins or more frequently the margins more or less detached from and united within the petiole into sheathing stipules often very deciduous. Flowers small, sessile in dense spikes or heads on axillary peduncles.

The genus is dispersed in the fresh or subsaline waters of the greater part of the globe.

SECTION I.—Leaves all alternate and petiolate with floating laminae, or the lower ones submerged. Stipules connate within the petiole.

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| Nutlets ovoid, scarcely beaked | 1. <i>P. natans</i> . |
| Nutlets with 3 prominent keels | 2. <i>P. tricarinatus</i> . |
| Nutlets with projecting processes on the outer angles | 3. <i>P. Tepperi</i> . |
| Floating leaves $\frac{3}{4}$ to $\frac{1}{2}$ in. long. Nutlets distinctly beaked | 4. <i>P. javanicus</i> . |

SECTION II.—Leaves all submerged, sessile or nearly so, those under the peduncles and branches opposite, the others alternate. Stipules connate within the petiole, often very deciduous.

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|--|----------------------------|
| Leaves stem-clasping, ovate or almost orbicular, many-nerved | 5. <i>P. perfoliatus</i> . |
|--|----------------------------|

Leaves narrow-oblong or rarely linear, usually 3-nerved, very obtuse, the margins often undulate-crisped 6. *P. crispus*.

Leaves narrow-linear, obtuse or scarcely acute, 1-nerved. Spikes $\frac{3}{4}$ in. long or more 7. *P. obtusifolius*.

SECTION III.—Leaves all submerged, sessile or nearly so with sheathing margins but no distinct stipules.

Leaves narrow-linear, 1-nerved. Stems repeatedly dichotomous 8. *P. pectinatus*.

1. ***P. natans*** (floating), *Linn.*; *Kunth, Enum.* iii. 127; *Benth. Fl. Austr.* vii. 170. Upper leaves or often the whole of them on long petioles, floating on the surface of the water, of a thick opaque texture, ovate or oblong, 2 to 4 in. long by 1 to 1½ in. broad, or rarely in small varieties about half that size, usually rounded at the base, but sometimes cordate or tapering, marked by several (5 to 9 or rarely 11) longitudinal nerves with a few cross veins often branched or slightly netted; lower submerged leaves usually few or often wanting, rarely all submerged thin and narrow but always tapering at the base into a stalk and several-nerved. Stipules closely sheathing, connate, free from the petiole except at the very base. Spike dense and cylindrical, often 1 in. long or more, on a stout peduncle. Nuts ovoid, above 1 line long, slightly compressed, nearly straight, with 1 or 3 dorsal ribs, obtuse or acute, quite entire or more or less denticulate or muricate.—*R. Br. Prod.* 343; *Hook. f. Fl. Tasm.* ii. 41; *F. v. M. Fragm.* viii. 217; *Reichb. Ic. Fl. Germ.* t. 50; *P. heterophyllus*, *Hook. f. Fl. Tasm.* ii. 41, and of some authors, but not the true plant of Schreber.

Hab.: Rockhampton, *O'Shanesy, Bowman*. A common species of the southern still waters.

The species is one of the most common over the greater part of the area of the genus.

2. ***P. tricarinatus*** (3-keeled), *F. v. M. ined. in Herb. Kew*; *A. Bennet in Journ. of Bot., June, 1887*.

The Queensland specimens referred to by Mr. Bennett were collected at Aramac some years ago by Mr. C. W. De Burgh Birch, and were placed by me at the time with *P. natans*. I only noticed then that the plant had a more robust habit and larger leaves on shorter petioles; the nuts also were prominently 3-keeled, the middle one almost wing-like and more decidedly toothed on its undulate edge. This species seems not to have been further described, and the specimens I now have are not suitable for the purpose of diagnosing the species.

3. ***P. Tepperi*** (after J. G. O. Tepper), *A. Bennett, Journ. of Bot., June, 1887*. Stems lengthening as in *P. natans*. Submerged lower leaves 4 in. long by $\frac{1}{2}$ in. wide, the lamina tapering at either end; upper leaves ovate-lanceolate; floating leaves from oval with subcordate bases to ovate with tapering bases; 21 to 23-veined, 3 in. long by 1½ in. broad, coriaceous, on long petioles enlarged gradually upwards. Spikes $\frac{3}{4}$ to 1 in. long, dense in fruit. Fruit nearly straight on the inner face, rounded, with three angles on the outer face, half-obovate, with a short beak forming a continuation of the inner face, with projecting processes irregularly distributed on the outer angles; embryo with its upper part incurved to half its depth.—*A. Benn. l.c.*

Hab.: Tooloomba Creek, *Bailey*.

Mr. Bennett points out that this species is allied to *P. natans*, *Linn.*, and in European herbaria has been mixed with specimens from Australia of *P. tricarinatus* and *P. natans*.

4. ***P. javanicus*** (of Java), *Hassk. in Verh. Natuurk. Ver. Ned. Ind.* i. Perhaps a variety of *P. natans*, with which it is closely connected through the small Tasmanian variety of that species. Stems almost filiform. Floating leaves oblong-elliptical or lanceolate, $\frac{3}{4}$ to 1½ in. long, acute at the base, few-nerved. Stipules very thin. Submerged leaves few, linear. Spikes dense, 4 to 6 lines long. Nutlets smaller than in *P. natans*, more distinctly rostrate and the ribs often but not always denticulate.—*P. tenuicaulis*, *F. v. M. Fragm.* i. 90, 244, viii. 217; *Benth. Fl. Austr.* vii. 171.

Hab.: Gulf of Carpentaria, *F. v. Mueller*; Brisbane River, *Bailey*; Moreton Bay, *Leichhardt*; Rockhampton, *Bowman, O'Shanesy*; Rockingham Bay, *Dallachy*; Mount Elliot, *Fitzalan*; also in Java, India, and tropical Africa.

5. **P. perfoliatus** (perfoliate), *Linn.*; *Kunth, Enum.* iii. 188; *Benth. Fl. Austr.* vii. 172. Leaves all submerged, alternate except under the peduncles and branches where they are opposite, all sessile, ovate or almost orbicular, clasping the stem with broad rounded auricles which are sometimes united on the opposite side, thin and many-nerved, $\frac{3}{4}$ to $1\frac{1}{2}$ in. long and often quite as broad. Stipules only on very young shoots. Peduncles longer than the leaves. Spike cylindrical, rarely above 6 to 8 lines long. Nutlets scarcely beaked.—*R. Br. Prod.* 348; *F. v. M. Fragm.* viii. 219; *Reichb. Ic. Fl. Germ.* t. 29.

Hab.: Southern waters.

6. **P. crispus** (crisped), *Linn.*; *Kunth, Enum.* iii. 188; *Benth. Fl. Austr.* vii. 172. Leaves all submerged, alternate and contracted at the base, except when under the branches or peduncles where they are opposite and stem-clasping, all linear or narrow-oblong, very obtuse, the margins usually undulate-crisped, 1 to 2 or rarely nearly 3 in. long, with a strong central nerve and a slender one on each side at some distance from it. Stipules only seen on the young shoots. Peduncles rather long. Spikes usually 4 to 5 lines long. Fruits rather large, distinctly beaked, the dorsal rib or ribs entire or rarely denticulate.—*R. Br. Prod.* 348; *F. v. M. Fragm.* viii. 217; *Reichb. Ic. Fl. Germ.* t. 29.

Hab.: Rockhampton, *O'Shanesy*; and many southern waters.

Common in the northern hemisphere. The typical form has the leaves very much broader than in *P. obtusifolius* and much crisped on the edges, but the narrow-leaved forms come very near to that species.

7. **P. obtusifolius** (leaves obtuse), *Mert. et Koch*; *Kunth, Enum.* iii. 185; *Benth. Fl. Austr.* vii. 172. Stems slender, terete, or somewhat flattened. Leaves all submerged, alternate, except under the peduncles or branches where they are opposite, narrow-linear, entire, usually 3-nerved with a very few transverse veins, obtuse or almost acute, sessile and rounded or shortly contracted at the base, mostly $1\frac{1}{2}$ to 3 in. long. Stipules often persistent and at length splitting into threads. Peduncles not long. Spikes usually $\frac{1}{2}$ in. or rather longer, not very dense. Nutlets about $1\frac{1}{2}$ line long, with a straight or hooked beak, often rugose, the dorsal rib and lateral angles usually obtuse and scarcely distinct but sometimes more prominent and toothed. Seed usually much curved with the upper end obliquely reflexed.—*F. v. M. Fragm.* viii. 216; *Reichb. Ic. Fl. Germ.* t. 25; *P. gramineus*, *R. Br. Prod.* 348; *Hook. f. Fl. Tasm.* ii. 42 and of some others.

Hab.: Common in the southern waters.

The *P. obtusifolius* is one of the most generally spread over the area of the genus.

8. **P. pectinatus** (comb-like), *Linn.*; *Kunth, Enum.* iii. 187; *Benth. Fl. Austr.* vii. 173. Stems very slender, repeatedly dichotomous. Leaves all submerged, very narrow-linear, 2 to 3 in. long, 1-nerved most of them dilated at the base into a rather long sheath, which is scarious at the edge and often projecting at the top into 2 small scarious lobes, the sheathing stipules of the other species wanting or rarely sheathing the base of the peduncle. Peduncles usually bearing several clusters of 2 or 3 flowers at some distance from each other, forming a slender interrupted spike, rarely reduced to a single terminal cluster. Nutlets of *P. obtusifolius* or rather smaller.—*Reichb. Ic. Fl. Germ.* t. 19; *P. marinus*, *Linn.*; *F. v. M. Fragm.* viii. 217; *Reichb. Ic. Fl. Germ.* t. 18.

Hab.: Still waters, Jimbour, *C. J. Gwyther*.

Very generally distributed over the area of the genus, in fresh and brackish waters.

4. RUPPIA, *Linn.*

(After Henry Barnard Ruppia.)

Flowers hermaphrodite, in a spike enclosed when young in the sheathing bases of the floral leaves. Perianth none. Anthers 2, each with 2 distinct cells

(described sometimes as 4 1-celled anthers), the cells opening outwards; pollen-grains narrow-oblong, slightly curved, with the ends somewhat dilated. Carpels 4, at first sessile, but soon protruded on long stalks, each with 1 pendulous ovule and terminating in a short style or almost sessile broad stigma. Fruiting carpels ovoid or pear-shaped, often oblique, obtuse or more or less produced into a slightly curved beak.—Subsaline aquatic plant, with slender much-branched stems and linear-filiform leaves.

The genus is limited to a single species, common in salt and brackish lagoons and marshes in most temperate or subtropical regions of the globe, varying much in the more or less slender foliage, in the beak of the fruit, etc., and divided by some botanists into several species.—*Benth*

1. **R. maritima** (maritime), *Linn.*; *Kunth, Enum.* iii. 128; *Benth. Fl. Austr.* vii. 174. Stems and leaves submerged, filiform, the leaves often very long, the barren ones slightly dilated at the base, the floral ones crowded several together, dilated at the base into thin almost scarious sheaths closely imbricate and completely enclosing the young spike, which soon emerges on a short or long and spirally coiled peduncle bringing it to the surface of the water. Flowers 2 to about 6, sessile, at first close together, at length often distant. Anthers not $\frac{1}{2}$ line long. Carpels at the time of flowering not exceeding the anthers, but immediately afterwards the anthers fall away, and the stalks of the carpels lengthen out to from $\frac{1}{2}$ in. to above 1 in. Ripe carpels about 1 line long or rather more.—*Hook. f. Fl. Tasm.* ii. 42; *F. v. M. Fragm.* viii. 217; *Nees. Gen. Fl. Germ.*; *Reichb. Ic. Fl. Germ.* t. 17.

Hab.: All along the southern coast.

5. ZOSTERA, Linn.

(From the resemblance of the leaf to a ribbon.)

Flowers unisexual, the males and females in alternate rows on the membranous rachis of a spike enclosed in the sheathing base of the floral leaf. Perianth none. Male flowers of a single sessile oblong laterally attached 1-celled anther; pollen confervoid. Female flowers of a single carpel, laterally attached near the apex and produced above the attachment into a filiform 2-branched style. Ovule 1, pendulous. Fruit an indehiscent pendulous nutlet. Embryo with a deep longitudinal groove, forming 2 valves which fold over the long curved linear cotyledonous end.—Marine submerged plants with a creeping rhizome emitting short stems, with long narrow grass-like leaves separating from their narrow sheathing bases by a transverse line. Peduncles axillary or terminal, bearing a single spike completely enclosed in the slightly dilated but continuous sheathing base of the floral leaf or spathe, which otherwise resembles the stem-leaves. Rachis of the spike broad and thin, with margins folded inwards and bearing the flowers and fruits only on the inner surface.

The genus consists of very few species, perhaps reducible to two only, common in most seas at or near the shores.

1. **Z. nana** (small), *Roth*; *Kunth. Enum.* iii. 117; *Benth. Fl. Austr.* vii. 176. Rootstock slender. Leaves narrow-linear, rarely above 1 line broad, varying in length from a few inches to 1 or 2 ft., usually truncate or notched at the end, with 1 conspicuous central nerve and 1 or 2 lateral ones on each side often scarcely apparent. Peduncles $\frac{1}{2}$ to 1 in. long, the floral leaf or spathe usually rather narrower than the others, except the sheath which is $\frac{1}{2}$ to $\frac{3}{4}$ in. long and above a line broad, the margins quite closed over the spike but not connected, the stigmas usually protruding at the time of flowering. Rachis of the spike thin and membranous, lining the inside of the sheath but free from it, the margins folded inwards and bearing just within the edge on each side 2 or 3 vertical plates

folded inwards over some of the flowers.—*Z. marina*, Hook. f. *Fl. Tasm.* ii. 44, and R. Br. *Prod.* 338? partly; *Z. Muellieri*, Irmisch; Aschers. in *Linnaea*, xxxv. 168.

Hab.: Southern coast.

6. NAIAS, Linn.

(A water-nymph.)

(*Caulinia*, Willd.)

Flowers unisexual, solitary in the axils of floral leaves, sessile or shortly pedicellate. Male flower: Anther single, 1 or 4-celled, enclosed in a thin membranous bract or perianth, irregularly lobed at the top and often splitting and rolling back so as to disclose the apex of the anther; pollen globular. Female flowers sessile. Perianth none besides the bract. Carpel 1, tapering into a style divided into 2, 3 or sometimes 4 stigmatic branches; ovule 1, erect. Fruit a small indehiscent oblong or cylindrical nutlet. Seed erect, with a hard testa; embryo straight, with a prominent plumula.—Submerged fresh-water or subsaline herbs, with slender branching stems. Leaves linear, in pairs or clusters so as to appear opposite or verticillate, bordered by minute or prominent acute or pungent teeth, dilated at the base into a membranous sheath often produced on each side into hyaline toothed or ciliate stipular lobes.

The genus is widely spread over the temperate and some of the warmer regions of the globe.

Leaves prominently toothed almost pinnatifid, the basal sheath not produced into scarious stipules 1. *N. major*.

Leaves very narrow, the teeth very minute, the basal sheath produced on each side into a broadly lanceolate stipular lobe 2. *N. tenuifolia*.

1. ***N. major*** (greater), *All.*; *Kunth*, *Enum.* iii. 112; *Benth.* *Fl. Austr.* vii. 181. Leaves linear, bordered by broad triangular acute very prominent teeth so as to be almost pinnatifid, $\frac{1}{2}$ to nearly 1 in. long, dilated at the base into a very short broad toothed sheath not different in texture from the lamina nor produced into stipular lobes, aculeate on the back as well as the stem but the prickles few or so minute as to be difficult to see on the dried specimens. Flowers dioecious. Male perianth oblong, consisting of a thin membranous sac entirely enclosing the anthers, 2 or 3-toothed and at length bursting irregularly at the top. Anther sessile, 4-celled. Female flower a single oblong carpel with 2 or 3 linear stigmatic lobes, the ripe nutlet about $1\frac{1}{2}$ line long.—*F. v. M. Fragm.* viii. 218; *Nees. Gen. Fl. Germ.* Ic.

Hab.: Flinders River, *F. v. Mueller*; Tweed River, *F. v. Mueller*.

The species is widely spread over the northern hemisphere.

2. ***N. tenuifolia*** (leaves thin), *R. Br. Prod.* 345; *Benth. Fl. Austr.* vii. 181. Stems slender, much branched. Leaves very narrow linear, flat and transparent, mostly about 1 in. long, 1-nerved, bordered by rather numerous very minute teeth often only visible under a strong lens, the sheathing base very short but produced on each side into a rather long broadly lanceolate ciliate-toothed stipular lobe. Male flower stipitate, oblong, about $\frac{1}{2}$ line long. Female carpel about 1 line long, oblong-cylindrical, produced into a filiform deeply 2-branched style as long as the carpels.—*F. v. M. Fragm.* viii. 219.

Hab.: Common in the southern waters.

7. CYMODOCEA, Kœn.

(After a sea-nymph.)

(*Amphibolis*, Agardh.)

Flowers unisexual, solitary within sheathing bracts, but with the bracts sometimes several in a cyme. Perianth none. Male flowers of 2 sessile anthers more or less connate by their backs, with 2 parallel cells opening outwards in

longitudinal slits. Female flowers of 2 distinct carpels, each tapering into a filiform style with 2 stigmatic branches or lobes; ovule 1 in each carpel, laterally attached near the top. Fruit-carpels 1-seeded, indehiscent (or at length opening in 2 valves?). Seed ovoid or oblong, testa membranous. Embryo with a short thick radicular base, grooved at the top with a slender incurved cotyledonous end.—Marine submerged plants, with a creeping rhizome rooting at the joints, the leafy stems very short or lengthened and erect. Leaves linear, narrow and long or rather broader and short, with a short sheathing base, in some species enclosed at the base in a long sheathing scale.

The genus extends over the Old World coasts of the Atlantic and Pacific as well as of the Indian and Mediterranean seas, with one West Indian species.

- Leaves at or near the ends of rather hard stems closely marked with the annular scars of fallen leaves rounded and ciliate-serrulate at the end;
 no external scales 1. *C. ciliata*.
 Leaves narrow on short stems, the nodes or scars rather distant, enclosed at the base in a sheathing scale.
 Leaves 2 to 3 lines broad 2. *C. serrulata*.
 Leaves 1 to 1½ line broad 3. *C. isoetifolia*.

1. ***C. ciliata*** (ciliate), *Elhreb.*; *Aschers. in Linnaea*, xxxv. 162, and in *Anleit. Wiss. Beob.* 363; *Benth. Fl. Austr.* vii. 178. Rhizome emitting hard almost woody stems of 3 or 4 in. to nearly 1 ft., marked with numerous annular scars of fallen leaves and ending in a tuft of broad linear leaves, usually falcate, 3 to 6 in. long and about 4 lines broad, rounded and ciliate-serrulate at the end, contracted at the base into a short brown sheath clasping the stem all round, the margins closing at the base but not united. Fructification unknown.—*C. serrulata*, F. v. M. *Fragm.* viii. 218, but not of R. Br.

Hab.: Various places along the coast from Northumberland Islands to Cape Upstart, *Fitzalan*.

2. ***C. serrulata*** (serrulate), *Aschers. in Anleit. Wiss. Beob.* 362; *Benth. Fl. Austr.* vii. 178. Leafy branches not so hard as in *C. ciliata*, and the leaves or annular scars of fallen leaves distant. Leaves broad-linear, shorter than in *C. ciliata*, varying from 2 to 3 in. long, rounded and minutely denticulate or almost entire at the end, the sheathing base rather longer than in *C. ciliata*. Fructification unknown.—*Caulinia serrulata*, R. Br. *Prod.* 389.

Hab.: Port Denison and other tropical localities.

3. ***C. isoetifolia*** (Isoetes-leaved), *Aschers. in Linnaea*, xxxv. 163; *Benth. Fl. Austr.* vii. 178. Habit of *C. serrulata*, but the leaves much narrower and remarkable when in fructification by the sheathing bracts, rather numerous, in a dichotomous cyme, although each pair encloses only a single flower.

Hab.: Edgecombe Bay, *Fitzalan*.

ORDER CXLIX. ERIOCAULÆÆ.

Flowers unisexual, in androgynous or rarely diceious heads, with imbricate, scarious dry or rarely herbaceous bracts, 1 under each flower, and usually a few outer ones empty. Perianth normally of 6 or 4 hyaline or scarious small segments in 2 rows, the inner ones immediately under the stamens or ovary, the outer ones lower down on the stipes or receptacle, but occasionally reduced in numbers, or those of one row more or less united, especially in the males. Stamens as many as the inner segments of the perianth and opposite to them or twice that number; filaments short; anthers small, 2-celled, the cells opening in longitudinal slits. Ovary of 3 or 2 lobes and cells, with 1 pendulous ovule in each cell; style single, with 3 or 2 filiform stigmatic branches. Capsules slightly enlarged from the ovary and of the same shape, the lobes opening dorsally in 2 valves. Seeds solitary in each cell, globular or ovoid, usually striate or

minutely tuberculate. Albumen mealy. Embryo small, ovoid or lenticular, remote from the hilum.—Herbs mostly marsh or aquatic, either tufted with radical leaves or the stems more or less elongated and covered with old leaves, the upper ones forming a terminal tuft. Leaves linear or filiform, rarely lanceolate. Scapes radical or peduncles terminal or in the upper axils, simple and leafless, but each one usually enclosed at the base in a sheathing scale, and bearing a single terminal head. Flowers very small, usually numerous in the head, the outer rows mostly female, the inner ones chiefly male, but the two sexes often variously intermixed, all concealed within the imbricate bracts, the tips of the stigmatic branches and sometimes the anthers slightly protruding, the receptacle often hairy.

The Order is limited in the Old World to the single genus *Eriocaulon*, but there are a few other genera, and one a very large one exclusively American and chiefly tropical.—*Benth.*

1. ERIOCAULON, Linn.

(Stamens often woolly.)

Male flowers : Inner perianth at the apex of a slightly thickened stalk, of 3 or 2 teeth or short distinct hyaline segments often fringed or ciliate and usually bearing on their inner face a small dark gland, the segments occasionally very minute or obsolete ; outer perianth affixed lower down on the stalk, of 2 or 3 segments either distinct or variously united. Stamens 6 or 4, of which 3 or 2 opposite the inner segments and as many alternating with them or occasionally fewer by abortion. Rudiments of the ovary either 3 glands in the centre of the flower or rarely deficient. Female flower : Inner perianth at the apex of a slender stalk (sometimes very short or scarcely any) of 3 or 2 hyaline segments usually erect and sometimes with a small gland on the inner face ; outer of 2 or 3 variously shaped segments affixed lower down on the stalk, or sometimes 1 or both perianth deficient. Ovary 3 or 2-lobed ; style branches 3 or 2, without alternate appendages.—Annuals or perennials with the leaves in radical tufts or rarely crowded on an elongated stem. Scapes or peduncles usually longer than the leaves.

The genus extends over the general area of the Order, but chiefly in the Old World, where it is the only one of the Order.

SERIES I.—*Flowers 3-merous or rarely partially 2-merous by abortion, especially the females.*

- | | |
|--|--------------------------|
| Submerged stems elongated, densely covered with filiform leaves. Flower-heads pubescent, at least at first | 1. <i>E. setaceum</i> . |
| Scapes and radical leaves above 1ft. long, loosely hairy towards the base. Flower-heads pubescent. Outer-perianth segments winged | 2. <i>E. australe</i> . |
| Scapes and radical leaves under 6in. and often much less, glabrous. Flowers-heads pubescent. Bracts with their tips incurved and appressed. Outer perianth-segments not winged. Flowering bracts broad, very obtuse, fringed only with very short hairs | 3. <i>E. Smithii</i> . |
| Flower-heads glabrous. Bracts with their tips incurved and appressed. Outer female perianth segments, linear, 3 or fewer or none. Outer male perianth segments united in a spatha-like scale. Outer female perianth-segments linear, dilated, inner narrow erect | 4. <i>E. nanum</i> . |
| Outer female perianth-segments very narrow, inner none | 5. <i>E. cinereum</i> . |
| Outer male perianth-segments linear or oblong-spathulate, free or nearly so. Outer and inner female perianth-segments linear. Plant not $\frac{1}{2}$ in. high, with small leaves | 6. <i>E. pusillum</i> . |
| Plant of 1 to 1 $\frac{1}{2}$ in., with rather broad linear leaves | 7. <i>E. pallidum</i> . |
| Outer female perianth-segments linear, inner none | 8. <i>E. nigricans</i> . |

SERIES II.—*Flowers all 2-merous.*

- | | |
|---|---------------------------|
| Outer female perianth-segments linear or spathulate, very deciduous, not winged. Scapes 4 to 6in. high. Leaves broadly linear, many-nerved. Heads near 3 lines diameter | 9. <i>E. spectabile</i> . |
|---|---------------------------|

Outer female perianth-segments complicated with a broad dorsal wing.

Heads at length globular, with the outer bracts reflexed and empty. All the female flowers with outer perianth.

Leaves mostly less than half as long as the scapes. Outer male perianth-segments broadly linear 10. *E. scariosum*.

Leaves more than half as long as the scape. Outer male perianth segments very narrow 11. *E. fistulosum*.

Heads broad. Outer bracts rigid, all flowering. Inner female flowers without outer perianth.

Scapes 2 to 4 in. high. Heads pale coloured 12. *E. depressum*.

Scapes 1 to 2 in. high. Heads nearly black 13. *E. deustum*.

1. ***E. setaceum*** (bristle-like), Linn.; Kunth, *Enum.* iii. 550; Benth, *Fl. Austr.* vii. 191. An aquatic plant with submerged floating stems lengthening out to 1 ft. or more, covered with linear-filiform almost capillary leaves of 1 to 2 in. Peduncles or scapes from amongst the upper leaves 2 to 3 in. long, or in very luxuriant specimens twice as long. Flower-heads depressed or at length nearly globular, rarely attaining more than 2 lines diameter and usually smaller, white with the mealy pubescence of the bracts, becoming dark-coloured as it wears off. Bracts broad, the outer empty ones in 1 or 2 rows. Male flower: 3 outer segments obovate-oblong, slightly fringed at the apex, connate into a lateral scale or at length separate; 3 inner short, usually fringed, with a small gland. Stamens 6. Female flower: 3 outer segments at the base of the stipes nearly equal, obovate-spathulate, concave, slightly fringed; 3 inner under the ovary linear, erect. Ovary 8-merous.

Hab: Recorded for Queensland without locality by F. v. M.

The species is common in E. India and the Malayan Archipelago. The Australian specimens all belong to the species as restricted by Kœrnicke, *Linnæa*, xxvii. 608, with the bracts and perianth-segments white-pubescent at the apex.—Benth.

2. ***E. australe*** (Australian), R. Br. *Prod.* 254; Benth. *Fl. Austr.* vii. 192. The largest of the Australian species. Scapes and leaves usually 1 to 1½ ft. high, sprinkled below the middle with long loose hair, the leaves grass-like, flat or concave, varying in breadth from 1 to 3 lines. Flower-heads depressed-globular or at length nearly as long as broad, attaining 3 to 4 lines diameter, white with the mealy indumentum of the bracts which rarely wear off in the old heads. Bracts closely imbricate, broadly obovate-orbicular, a few outer empty ones glabrous and shorter than the others. Flowers in some heads mostly males, in others the females more numerous. Outer perianth-segments in both sexes complicate, more or less connate, especially in the males, the dorsal keel broadly winged; third segment very narrow in the males, oblong-lanceolate and concave in the females. Inner segments linear and slightly fringed, short in the males, longer in the females. Stamens 6. Ovary 8-merous.

Hab.: Wide Bay, *Bidwill*; Rockingham Bay, *Dallachy*; Stradbroke Island South to N.S.W.

3. ***E. Smithii*** (after Sir J. E. Smith), R. Br. *Prod.* 254; Benth. *Fl. Austr.* vii. 192. Scapes slender, 3 to 5 in. long. Leaves linear or linear-lanceolate, usually about 1 in. long. Flower-heads soon globose; outer bracts ovate, glabrous, at first very conspicuous but almost concealed under the old heads; flowering bracts thin, obovate, scarcely acuminate, glabrous on the back but the broad margins ciliate with short hairs. Male flower: Outer perianth-segments 3, oblong-linear, contracted at the base and more or less connate at first, slightly hairy at the tips; inner segments small, fringed. Stamens 6. Female flower: Outer-segments dark-coloured, oblong-spathulate, concave, incurved, one of them often deficient; inner segments erect, linear-oblong, fringed and hairy at the end with a small gland as in the males. Ovary 8-merous.

Hab.: Moreton Bay, F. v. Mueller; Cape River, Bowman; Springsure, Wuth.

The most frequently met-with species.

4. **E. nanum** (dwarf), *R. Br. Prod.* 254; *Benth. Fl. Austr.* vii. 198. Scapes in the specimens seen $\frac{1}{2}$ to $\frac{3}{4}$ in. high and the leaves mostly under $\frac{1}{2}$ in., linear but not very fine. Flower-heads 1 to $1\frac{1}{4}$ line diameter, glabrous. Bracts scarious, oblong or ovate-oblong, the outer empty ones obtuse and pale-coloured, the flowering ones rather more acute and darker. Male flower: Outer perianth-segments united in a broad dark spathe-like scale open on one side and shortly 8-toothed; inner-segments scarcely prominent. Stamens 6. Female flower: 2 or 3 outer-segments linear or lanceolate and concave, dark, dilated in the middle; 3 inner narrow-linear, but unequal, erect, denticulate, with a small gland. Ovary 8-merous.

Hab.: Facing Island, Shoalwater Bay, *R. Brown*; Brisbane River, *Bailey*.

5. **E. cinereum** (ash-coloured), *R. Br. Prod.* 254; *Benth. Fl. Austr.* vii. 193. Scapes filiform, attaining in the larger specimens 3 to 5 in. but sometimes not above 1 to $1\frac{1}{2}$ in. Leaves radical, linear-filiform, from under $\frac{1}{2}$ in. to nearly 2 in. Flower-heads hemispherical, about 1 line diameter when first out, but attaining $1\frac{1}{2}$ line when in fruit. Bracts thinly scarious, glabrous, a few outer empty ones obovate or oblong and obtuse, the flowering ones broadly-lanceolate, acute or acuminate, with appressed tips, contracted at the base. Male flower: Outer perianth united in an orbicular concave unilateral 8-toothed or 8-lobed scale, sometimes darker-coloured than the rest of the head and enclosing the rest of the flower; inner segments small, lanceolate, fringed, with small glands. Stamens usually 8, rarely 4 or 5; anthers pale-coloured. Female flower: Stipes rather long, with 8 linear almost capillary segments a little below the ovary, the inner segments deficient. Ovary 2 or 8-celled.—*E. heteranthum*, *Benth. Fl. Hongk.* 382; *E. ciliiflorum*, *F. Muell. Fragm.* i. 95.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*.
The species stretches to South China.

6. **E. pusillum** (small), *R. Br. Prod.* 254; *Benth. Fl. Austr.* vii. 194. The smallest of the known species of the genus, the scapes scarcely $\frac{1}{2}$ in. high, the loose sheathing-scales more than half as long. Leaves unknown. Flower-heads scarcely 1 line diameter. Bracts scarious, glabrous, or very slightly ciliate at the end, a few outer ones empty, the flowering ones with appressed tips. Male flower: outer perianth-segments 2, narrow, free; inner segments very small or one only longer and fringed. Stamens 3, rarely 4 or 5; anthers dark-coloured. Female flower: Outer segments 2 or 3, linear, at the base of the stipes; inner segments 3, linear, erect and appressed to the ovary slightly fringed. Ovary 3-celled.

Hab.: Endeavour River, *Banks and Solander*.

7. **E. pallidum** (pale), *R. Br. Prod.* 254; *Benth. Fl. Austr.* vii. 194. Leaves in the few specimens seen broadly linear, 1 to $1\frac{1}{2}$ in. long, tapering to a fine point. Scapes about as long. Flower-heads globular, the bracts all obtuse, scarious, glabrous and rather shining. Male flower: Outer perianth-segments 2, linear; inner segments minute or obsolete. Stamens 3. Female flower: Outer segments 2, linear, inner 3, narrow, erect, ciliate. Ovary 8-merous.

Hab.: Endeavour River, *Banks and Solander*.

8. **E. nigricans** (blackish), *R. Br. Prod.* 254; *Benth. Fl. Austr.* vii. 194. Scapes filiform, 1 to 2 or rarely 3 in. long. Leaves shorter, sometimes very short, narrow-linear, tapering to a long fine point. Flower-heads globular or somewhat depressed, $1\frac{1}{2}$ or nearly 2 lines diameter. Bracts scarious, shining and silvery white at the inflexed tips, sometimes dark in the lower part, a few outer empty ones obtuse, the flowering ones ovate-lanceolate, obtuse or almost acute. Male flower: Outer perianth-segments 3, linear, slightly dilated in the middle, all free; inner segments very small and glabrous or scarcely prominent. Stamens 6.

Female flower: Outer perianth-segments 1, 2, or 3, linear, at the base of the stipes; inner segments none. Ovary 8-merous.—*E. achiton*, Kærn. in Linnæa, xxvii. 680.

Hab.: Carron Creek, Carpentaria, *Gulliver*; Endeavour River, *Banks and Solander*; various localities in the neighbourhood of Rockhampton, *Bowman*, *O'Shaneys*; Dry-beef Creek, *Leichhardt*.

9. ***E. spectabile*** (showy), *F. v. M. Fragm.* i. 95; *Benth. Fl. Austr.* vii. 196. Scapes striate, 3 to 6 in. high. Leaves more than half as long, broadly linear, tapering to a fine point. Flower-heads from a pale straw-colour to silvery-white, at first depressed but soon globular, about 3 lines diameter. Outer empty bracts obovate or almost orbicular, obtuse, almost herbaceous; flowering bracts ovate or the inner ones lanceolate, scarious and white but glabrous. Male flower: Outer perianth-segments 2, narrow, about halfway up the stipes; inner segments minute or obsolete. Stamens 4. Female flower: Outer segments 2, linear-spathulate, falcate, concave but not winged, rather rigid, attached below the middle of the stipes but very deciduous; inner segments erect, hyaline, very narrow linear. Ovary 2-merous.

Hab.: Gulf of Carpentaria, *F. v. Mueller*.

10. ***E. scariosum*** (scarious), *R. Br. Prod.* 255; *Benth. Fl. Austr.* vii. 197. Scapes slender, striate, 3 to 5 in. long. Leaves thick at the base, tapering to a fine point, about 1 in. long. Flower-heads of a light brown colour, soon becoming globular, not above 2 lines diameter. Bracts orbicular, all scarious and glabrous, a few outer ones very obtuse and empty, the flowering ones shortly mucronate, the receptacle villous with long hairs. Male flower: Outer perianth-segments 2, linear, slightly-enlarged upwards, often slightly fringed at the end; inner segments reduced to two small teeth. Stamens 4. Female flower: Outer segments 2, falcate, concave or complicate with a broad dorsal wing; inner segments 2, erect, oval-oblong or obovate, denticulate at the end, shortly contracted at the base into a claw. Ovary 2-merous.

Hab.: Queensland, *F. v. Mueller*.

11. ***E. fistulosum*** (pipe-like), *R. Br. Prod.* 255; *Benth. Fl. Austr.* vii. 197. Evidently very near *E. scariosum* and most probably a variety only, with longer leaves, attaining more than half the scape, and the outer perianth-segments in the male flowers very narrow.

Hab.: Endeavour River, *Banks and Solander*.

12. ***E. depressum*** (depressed), *R. Br. Prod.* 255; *Benth. Fl. Austr.* vii. 197. Scapes rigid, striate, 2 to 4 in. long. Leaves as in *E. scariosum* rather thick at the base, tapering to a fine point, short in some specimens, but in other specimens more than half as long as the scape. Flower-heads pale-coloured, depressed-globular or hemispherical, nearly 3 lines diameter when fully out. Bracts all orbicular, a few outer ones more rigid and very obtuse, the others thinner and mucronulate, but all flowering. Male flower: Outer perianth-segments wanting; inner segments reduced to 2 small teeth. Stamens 4. Female flower: Outer segments in the flowers of the outer rows 2, falcate, concave or complicate with a broad dorsal wing, more or less connate, deficient in the inner rows of flowers; inner segments erect, obovate or oblong. Ovary 2-merous.—*E. heterogynum*, *F. v. M. Fragm.* i. 93.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*.

13. ***E. deustum*** (of a burnt colour), *R. Br. Prod.* 255; *Benth. Fl. Austr.* vii. 197.—Very near *E. depressum* and perhaps a variety, differing only in its small stature and the very dark, almost black colour of its scapes and flower-

heads. Scapes 1 to 2 in. high, scarcely exceeding the leaves. Flower-heads and flowers of the size and structure of those of *E. depressum*, the outer obtuse rather rigid bracts rather more numerous, but all floriferous as in that species, and the inner female flowers similarly without outer perianth.

Hab.: Endeavour River, *Banks and Solander*. This is the species to which Banks and Solander originally gave the MS. name of *E. depressum*, which Brown transferred to the preceding species.—*Benth.*

ORDER CL. CENTROLEPIDÆÆ.

Flowers hermaphrodite or polygamous, sessile and solitary or several together within more or less herbaceous bracts, with or without 1, 2 or rarely 3 hyaline scales to each flower. Perianth none. Stamen 1, filament filiform, anther oblong or linear, 1-celled, versatile, opening in a longitudinal slit. Ovary 1, with 1, 2 or 3 collateral cells or 2 or more cells or carpels, superposed in 2 rows, with 1 pendulous ovule in each cell or carpel; styles as many as cells or carpels, free or more or less united, terminating in linear stigmas. Fruits of the shape of the ovary, the pericarp membranous, the cells or carpels opening externally in longitudinal slits. Seeds 1 in each cell or carpel or fewer by abortion, pendulous and often laterally adnate to the pericarp; testa thin; albumen somewhat mealy. Embryo small, obovoid or conical, at the end of the albumen furthest from the hilum.—Small tufted plants, mostly annuals, with linear or filiform radical leaves and slender or very short scapes. Flowers very small, in solitary terminal heads or spikes, rarely reduced to a single flowers.

Only the type genus represented in Queensland.

1. CENTROLEPIS, Labill.

(Spurred scales.)

(*Desvauxia* and *Alepyrum*, *R. Br.*)

Flowers hermaphrodite, several together or rarely solitary, sessile within 2 sheathing bracts, each one within 1, 2 or 3 hyaline scarious scales rarely entirely deficient. Stamen 1, filament filiform; anther oblong-linear, dorsally attached. Ovary of 3 or more carpels (rarely reduced to 2 or 1) laterally adnate and superposed in 2 rows to one side of a linear receptacle, each with 1 pendulous ovule; styles 1 to each carpel, all distinct or more or less united at the base, all undivided and ending in a linear-filiform stigma. Fruiting carpels slightly enlarged from the ovary and of the same shape; pericarp membranous, opening outwards in a longitudinal slit. Seed of the shape of the carpel and often laterally adnate to the pericarp; testa appressed; embryo small, obovoid or almost lenticular, in a mealy albumen, distant from the hilum.—Small tufted plants mostly annuals. Leaves linear-filiform, all radical. Scapes simple, terminating in the 2 bracts either close together or one a little distant from the other, both flowering or the lower one empty.

The genus is almost limited to Australia.

Spikes narrow, containing 1 to 4 flowers, the outer bracts erect and glabrous, inner scales few and narrow or none. Flowers 1 or very rarely 2 in the spike. Leaves 3 or 4 lines long. Scape usually 1 in. long or more.

Outer bract aristate

1. *C. polygyna*.

Spikes ovate or broad, containing more than 4 flowers, the outer bracts glabrous or rarely with a few hairs erect or spreading, and 1, 2 or 3 scales under each flower, usually very prominent.

Leaves and scapes $\frac{1}{2}$ to $\frac{3}{4}$ in. Flowers 4 to 6 in the spike. Carpels usually more than 6

2. *C. pusilla*.

Scapes usually 1 to 2 in. Flowers 4 or more in each outer bract.

Outer bracts with long leafy points. Carpels usually 3 to 6

3. *C. aristata*.

Outer bracts scarcely pointed. Flowers numerous. Carpels 10 to 20

4. *C. Banksii*.

Spikes usually ovate or broad, the outer bracts hispid with long spreading hairs. Inner scales prominent.

Outer bracts scarcely spreading with awns usually longer than the bract.

Carpels usually 3. Styles free or nearly so 5. *C. fascicularis*.

Outer bracts spreading with short points. Carpels more than 6. Flowers very numerous 6. *C. exserta*.

1. ***C. polygyna*** (carpels numerous), *Hieron. Centrol.* 96; *Benth. Fl. Austr.* vii. 208. Though slender and sometimes very small this species is more rigid than its nearest allies. Leaves capillary, usually 3 or 4 lines long. Scapes in the typical form usually about 1 in. long, though occasionally more than twice or scarcely half as much, of a rather dark colour as well as the floral bracts which are close together, narrow, erect, rigid, glabrous, about 2 lines long, the outer one with a rigid awn at least as long and sometimes above twice as long, the inner one with a very short point. Flowers solitary or very rarely 2 together in the inner or upper bract, with a thin hyaline scale. Filament usually shortly adnate to the axis of the carpels. Carpels varying from about 6 to above 20; styles very shortly connate.—*Alepyrum polygynum*, R. Br. Prod. 253; Hook. f. Fl. Tasm. ii. 78; Nees in Pl. Preiss. ii. 71.

Hab.: Queensland, *F. v. Mueller*.

2. ***C. pusilla*** (weak), *Ram. et Schult. Syst.* i. 44; *Benth. Fl. Austr.* vii. 205. A small tufted plant with scapes and leaves of about $\frac{1}{2}$ in. Floral bracts close together and glabrous but somewhat spreading, obtuse or scarcely pointed, but little more than 1 line long. Flowers about 4 in the whole spike, with 1 or 2 hyaline scales to each flower rather prominent. Carpels of the ovary 6 to 7 according to R. Brown, 7 to 13 according to Hieronymus; styles free.—*Hieron. Centrol.* 97; *Desvauxia pusilla*, R. Br. Prod. 253.

Hab.: Point Lookout, *Banks and Solander*.

3. ***C. aristata*** (awned), *Ram. et Schult. Syst.* i. 44; *Benth. Fl. Austr.* vii. 206. Leaves linear, sometimes very short and fine but often a few of them nearly $\frac{1}{2}$ line broad and above 1 in. long. Scapes 1 to 2 in. high, flattened under the spike. Floral bracts close together, glabrous, ovate, erect, 2 to near 3 lines long, with long leafy points, that of the lower bract often $\frac{1}{2}$ in. and sometimes 1 in. long, the other one shorter. Flowers in each bract from 6 to about 20, intermixed with hyaline scales, some very narrow and entire, others broader and jagged at the end, always 1 under each stamen and 1 under or by the side of each ovary, with a few apparently additional ones. Carpels of the ovary few, varying from 3 or 4 to 6 or 7.—Hook. f. Fl. Tasm. ii. 76, t. 138; *Hieron. Centrol.* 99; *Desvauxia aristata*, R. Br. Prod. 253.

Hab.: Stanthorpe.

4. ***C. Banksii*** (after Sir Joseph Banks), *Ram. et Schult. Syst.* i. 44; *Benth. Fl. Austr.* vii. 207. Very similar to *C. exserta*, but quite glabrous in all its parts. Leaves filiform mostly about $\frac{1}{2}$ in. long, and scapes from that to 1 in. or rather more. Spike broad, the floral bracts very spreading, about $1\frac{1}{2}$ line long, ovate, acute or tapering into a short point. Flowers numerous in both bracts, the hyaline scales usually 2 to each flower and often as long as the outer bract. Carpels of the ovary from 10 to 20.—*Hieron. Centrol.* 99; *Desvauxia Banksii*, R. Br. Prod. 258.

Hab.: Endeavour River, *Banks and Solander*.

5. ***C. fascicularis*** (fascicled), *Labill. Pl. Nov. Holl.* i. 7, t. 1; *Benth. Fl. Austr.* vii. 207. Leaves $\frac{3}{4}$ to $1\frac{1}{2}$ in. long, usually ciliate below the middle with a few long hairs. Scapes slender, 1 to 3 in. high, glabrous or rarely sprinkled with a few short hairs. Floral bracts at a short distance from each other, ovate,

hispid with long rigid hairs, $1\frac{1}{2}$ to 2 lines long, with glabrous awns about the length of the bract or that of the lower bract longer. Flowers 4 to 8 in each bract, a hyaline scale under each stamen often as long as the bract and toothed at the end, and usually but not always a smaller scale under or by the side of each ovary. Carpels of the ovary 2 to 4, usually 3; styles nearly free.—Desv. in Ann. Sc. Nat. ser. 1, xiii. t. 2; Endl. Iconogr. t. 49; Hook. f. Fl. Tasm. ii. 77; Hieron. Centrol. 102; *C. cuspidigera*, Rudge in Trans. Linn. Soc. x. 263, t. 12; *Desvauxia Billardieri*, R. Br. Prod. 252; *D. longifolia*, Gaudich in Freyc. Voy. Bot. 418.

Hab.: Stanthorpe.

6. *C. exserta* (exserted), *Ram. et Schult. Syst.* i. 44; *Benth. Fl. Austr.* vii. 208. Leaves shortly hairy, under lin. long. Scapes slender, pubescent or glabrous, 1 to 3 in. high. Floral bracts placed near together, very spreading, ovate-lanceolate, shortly awned or mucronate, hispid, about 2 lines long. Flowers numerous in each bract; hyaline scales usually 2 to each flower, nearly as long as the outer bract, often jagged at the end, and sometimes a third small one. Carpels of the ovary 6 to 10; styles very shortly connate.—Hieron. Centrol. 101; *Desvauxia exserta*, R. Br. Prod. 253; Guillem. Ic. Pl. Austr. t. 17.

Hab.: Endeavour River, Banks and Solander.

Var. *rubra*. A smaller plant, the most parts being of a purplish or reddish colour.

Hab.: Fraser's Island, Hon. Miss Lovell.

ORDER CLI. RESTIACEÆ.

Flowers unisexual, or very rarely and exceptionally hermaphrodite, mostly dioecious, either in spikelets, with imbricate dry rigid bracts or *glumes*, 1 under each flower and usually a few outer ones empty, or in 2 genera in narrow or spike-like panicles, the glumes not imbricate. Perianth of 6, rarely 5, 4 or 3 glume-like or scarious erect segments in 2 rows. Male flower: Stamens 3, filaments filiform and free or united in a column; anthers oblong 1-celled and dorsally attached, or in 3 genera 2-celled with the cells dorsally attached in the centre only, the cells always opening by a longitudinal slit, a rudimentary ovary occasionally present in the centre of the flower. Female flower: Staminodia in some species 3, short or filiform with or without rudimentary anthers, in others entirely wanting. Ovary sessile or shortly stipitate, 1, 2 or 3-celled with one pendulous ovule in each cell. Styles as many as cells, usually long linear or filiform and stigmatic along the inner side from below the middle or almost to the base, all free or more or less united at the base. Fruit dry, often hard, usually small, either 2 or 3-celled and 2 or 3-angled, opening along the angles, or 1-celled and either opening along 1-side, or an indehiscent nut. Seeds 1 in each cell, attached at or near the top, usually striate or minutely tubercular-rugose; testa appressed; albumen usually mealy. Embryo small, lenticular or obovoid, at the base of the albumen at the end remote from the hilum.—Herbs usually perennial, with a rush-like or sedge-like habit, either with a tufted base or hard horizontal or creeping rhizome usually covered with closely imbricate scales. Stems simple or branched, erect or flexuose and variously twisted. Leaves none or few, radical and long-linear or sedge-like, but the stems usually bear at the base several closely imbricate dry scales and higher up a few sheathing scales the margins closed but not connate into a cylinder at least at the base, occasionally opening at the upper end and often bearing a short or lengthened point or imperfect lamina, the upper sheaths, under the inflorescence and its branches, transformed into floral bracts, usually shorter, broader and more open than the stem-sheaths, and sometimes the last long broad and spatha-like. Spikelets solitary or clustered and sessile or pedicellate within each floral bract,

the flowers when in spikelets sessile or very shortly pedicellate without bracteoles and concealed under the glume, or when not in close spikelets having usually but not always a pair of bracteoles at their base.

The Order is almost limited to extratropical South Africa, Australia and New Zealand.

Restiaceæ are closely allied in habit and inflorescence to *Cyperaceæ* and in the perianth to *Juncaceæ* but readily distinguished from both by the pendulous ovules and seeds. The great dissimilarity in habit and inflorescence between the males and females of some species often renders even their generic determination very difficult or uncertain from dried specimens, where only one sex is present or the sexes are mismatched. In some cases indeed the males of species belonging to different genera are more like each other than these of congeneric species.

—*Benth.*

Ovary 2 or 3-celled. Styles or style branches 2 or 3.

Anthers 1-celled.

Flowers in narrow or spike-like panicles, the glumes scarcely imbricate and usually 2 bracteoles under each flower 1. LEPYRODIA.

Flowers in spikelets with imbricate glumes, the spikelets several-flowered in both sexes or the females 1-flowered 2. RESTIO.

Ovary 1-celled with a single ovule. Styles or style branches 3.

Female spikelets several-flowered as well as the males. Pericarp usually opening laterally 3. LEPTOCARPUS.

Female spikelets 1-flowered. Nut indehiscent. 4. HYPOLENA.

1. LEPYRODIA, R. Br.

(Referring to the scaly inflorescence.)

Flowers diœcious, monœcious, or rarely hermaphrodite, in narrow or spike-like panicles, the glumes not closely imbricate and shorter than the perianth. Perianth-segments 6, glume-like or thin and almost hyaline. Male flower: Stamens 3, filaments free; anthers 1-celled. Female flower: Staminodia usually 3, filiform clavate or with an abortive anther. Ovary 3-angled, 3-celled; styles 3, either distinct or more or less connate at the base, linear, stigmatic from the middle or almost from the base. Capsule 3-lobed or 3-angled, opening at the angles.—Stems simple or branched, leafless except the sheathing scales. Male and female inflorescences not very different. Bracteoles under each flower within the glume usually 2, deficient however in two species.

The genus is limited to extratropical Australia.

Outer perianth-segments as long as or longer than the inner.

Tall plant. Sheathing scales loose. Floral bracts with long points . . . 1. *L. scariosa*.

Outer perianth-segments at least in the males shorter than the inner.

Sheathing scales closely appressed.

Stems loosely branched. Flowers in almost sessile distant clusters along the branches 2. *L. interrupta*.

1. ***L. scariosa*** (scarious), *R. Br. Prod.* 248; *Benth. Fl. Austr.* vii. 215. Rhizome creeping. Stems erect, terete, glabrous, 1 to 2ft. high. Sheathing scales brown, loose, often above 1in. long and in some luxuriant specimens 2in., the upper ones with short points. Inflorescence a narrow pale-brown thyrsoid panicle, with short unequal erect branches, the lower ones often distant, the others more crowded. Bracts under the lower branches rigid with long points, under the upper branches smaller, broader and more scarious. Flowers sessile or shortly pedicellate within scarious glumes shorter than the perianth and 2 hyaline bracteoles at the base of the pedicel, sometimes very short, sometimes almost as long as the glume. Perianth-segments in both sexes about 2 lines long, lanceolate, acute, pale brown. Male flowers with a small rudiment of the ovary, females with slender staminodia.—*F. v. M. Fragm.* viii. 72; *L. hermaphrodita*, Nees. in Sieb. Pl. Exs. n. 51, not of R. Br.

Hab.: Stradbroke Island and towards Wallangarra.

2. ***L. interrupta*** (interrupted), *F. v. M. Fragm.* viii. 74; *Benth. Fl. Austr.* vii. 217. Stems very slender, undivided or branched, often above 1ft. long. Sheathing scales when below the branches closely appressed, rigid, with a short

reflexed very deciduous point, those under the branches and clusters of flowers broad, loose, light-coloured or the upper ones scarious. Flowers in sessile clusters distant along the end of the stem, each cluster in the axil of a broad loose sheathing bract of 2 or 3 lines, the female flowers only 3 or 4 in the cluster, the male clusters more developed with more flowers. Glumes and bracteoles scarious, acutely acuminate, not much shorter than the perianths. Perianth-segments rigid, very acute, a little more than a line long, all nearly equal in the females, the inner ones longer and broader than the outer in the males. Filaments short in the males. *Staminodia* prominent in the females.

Hab.: Islands of Moreton Bay, and Brisbane River.

2. RESTIO, Linn.

(So named from species having been used for cord.)

(*Megalotheca*, *F. v. Muell.*)

Flowers diceious, both sexes several together or the females solitary, in spikelets with imbricate glumes and no bracteoles. Perianth-segments 4, 5 or 6, glume-like or the inner ones almost hyaline, not exceeding the glumes. Male flower: Stamens 3, filaments filiform, free; anthers 1-celled. Rudimentary ovary small or none. Female flower: *Staminodia* 3 or none. Ovary 2 or 3-celled; styles 2 or 3, free from the base or very shortly connate, stigmatic almost from the base. Capsule flat and 2-celled or 3-angled and 3-celled, the cells opening at the angles or very rarely irregularly breaking up on the sides.—Stems simple or branched, leafless except the sheathing scales which are usually persistent. Male and female inflorescences similar or very different, the male spikelets either pedicillate and paniculate or sessile along the branches, the females often more sessile, solitary, clustered or spicate, but sometimes paniculate like the males. The young plants of the first year in several species have two or three of the sheaths at the base of the stem produced into short linear leaves.

The genus is very largely represented in South Africa, without, however, a single species identical with the Australian ones which are all endemic.

SECT. I. **Stachygynia**.—*Stems various. Both male and female spikelets several flowered.*

Spikelets (in both sexes?) small and numerous in a dense terminal panicle.

Spikelets ovoid, very shining, with fine-pointed glumes. Tropical species

1. *R. tropicus*.

Spikelets (in both sexes?) terminating branches or rigid peduncles or sessile along the branches, numerous. Stems slender, glabrous.

2. *R. dimorphus*.

Spikelets in both sexes nearly similar, mostly erect and shortly pedicellate on a simple rhachis or in a narrow interrupted panicle.

Sheathing scales obtuse and erect.

Stems simple, terete. Spikelets numerous, 2 to 3½ lines long. Sheathing scales all closely appressed

3. *R. gracilis*.

Stems very flat

4. *R. complanatus*.

Stems terete, tall, with dense clusters of fine barren branches. Spikelets numerous

5. *R. tetraphyllus*.

1. ***R. tropicus*** (tropical), *R. Br. Prod.* 246; *Benth. Fl. Austr.* vii. 223. Rhizome not seen. Stems stout, undivided, above 2ft. high. Sheathing scales closely appressed, acute. Male spikelets very numerous in a much branched thyrsoid or pyramidal panicle of 4 to 6in., nearly sessile along the almost filiform branches all of a rather light shining brown, about 2 lines long. Glumes almost scarious, broadly lanceolate, tapering to a fine point, 1 or 2 outer ones shorter and empty. Perianth-segments 5, 2 outer ones narrow, acuminate, complicate, 3 inner ones shorter broader hyaline and almost obtuse. Female plant unknown.

Hab.: Gulf of Carpentaria, *R. Brown*.

The female plant being unknown the genus of this species must remain uncertain, it may very possibly be a *Leptocarpus*, the male inflorescence is, however, very different from that of any other species of either genus.—*Benth.*

2. **R. dimorphus** (2-formed), *R. Br. Prod.* 246; *Benth. Fl. Austr.* vii. 224. Rhizome creeping, but the woolly hairs not abundant. Stems slender, 1 to 2ft. long, divided into weak branches all floriferous, often from near the base. Sheathing scales rather broad, loose and open almost from the base, spreading upwards obtuse and glabrous; floral bracts shorter than the spikelets. Male spikelets numerous, ovate, sessile or nearly so within the bract, distant along the branches or terminal, about 2 lines long. Glumes obovate or oblong, acuminate with a rather short point, not at all or scarcely ciliate, several outer ones empty. Perianth-segments 6. Filament shortly callous at the base but no rudiment of the ovary. Female plant: Spikelets fewer and more distant, all sessile and 1-flowered but with several empty glumes, inner glumes acuminate, $1\frac{1}{2}$ line long, with rather long points. Perianth segments 5 (or 6?), oblong, obtuse, nearly equal. Ovary 2-celled, or according to Brown 3-celled. Styles united at the base. Capsule hard, broad, opening at the sides and frequently 1-celled by abortion and then very oblique.—*F. v. M. Fragm.* viii. 68.

Hab.: Islands of Moreton Bay.

3. **R. gracilis** (slender), *R. Br. Prod.* 245; *Benth. Fl. Austr.* vii. 227. Stems slender, the sheathing scales closely appressed and the numerous small spikelets forming an interrupted more or less compound spike or narrow panicle of 2 to 4 in. Floral bracts acuminate with a fine point. Male spikelets rather broad, varying from $2\frac{1}{2}$ to $3\frac{1}{2}$ lines long, nearly sessile or almost all on pedicels as long as or longer than the bracts. Perianth-segments 6, the 2 outer ones complicate. Female spikelets longer and more sessile, very narrow in some specimens, broader in others. Flowers 2-merous, no staminodia.—*F. v. M. Fragm.* viii. 69; *R. pallens*, *R. Br. Prod.* 245.

Hab.: Moreton Island, *F. v. Mueller*; Brisbane, *Prentice*; and towards the Tweed and Wallangarra.

4. **R. complanatus** (compressed), *R. Br. Prod.* 245; *Benth. Fl. Austr.* vii. 228. Rhizome short and thick with little or no wool. Stems densely tufted, erect, simple, much flattened. Sheathing scales appressed, obtuse, rather thin, $\frac{1}{2}$ to $\frac{3}{4}$ in. long. Male spikelets rather numerous, in a narrow panicle, on filiform, pedicels, narrow-ovate, scarcely 3 lines long. Glumes shortly acuminate, slightly ciliate, the midrib produced into a fine point, one or two outer ones short and empty. Perianth often shortly stipitate within the glume, segments 4, narrow. Stamens 2. Female spikelets usually fewer and narrower than the males and sometimes longer, the glumes rather distant. Ovary sessile, 2-merous. Capsule scarcely dehiscent.—*Hook. f. Fl. Tasm.* ii. 71; *F. v. M. Fragm.* viii. 67.

Hab.: Common in the southern coastal swamps.

R. tetraphyllus (4-leaved), *Labill. Pl. Nov. Holl.* ii. 77, t. 226, 227; *Benth. Fl. Austr.* vii. 228. Rhizome thick, densely woolly-hairy under the short broad scales. Stems erect, 2 or 3ft. high, usually bearing filiform dichotomous branches, either short and dense or longer and loose, clustered within the erect appressed sheathing scales. Spikelets in both sexes usually rather numerous, pedicellate in a narrow loose panicle. Male spikelets from narrow-ovate to nearly globular, 2 to 3 lines long. Glumes acuminate, with short fine points. Perianth-segments 6, 2 outer rather broad and complicate, the third narrow, 3 inner flat and hyaline, 1 broad and 2 narrow. Female spikelets usually longer and narrower, the glumes more acuminate. Perianth-segments 4, 2 outer ones complicate and lanceolate, 2 inner broader and flat, but with the margins folded in. Capsule small, flat, not usually opening at the margins but the thin sides bursting irregularly.—*R. Br. Prod.* 247; *Hook. f. Fl. Tasm.* ii. 71; *F. v. M. Fragm.* viii. 66.

Hab.: Brisbane River, *Leichhardt*, *Bailey*; Wide Bay, *Sheridan*; Rockhampton, *Thozet*; and further north.

3. LEPTOCARPUS, R. Br.

(Fruit slender.)

Flowers dicecious, both sexes in spikelets with imbricate glumes without bracteoles, or the females in compound spikelets with bracteoles. Perianth-segments 6 or fewer by abortion, variously shaped. Male flower: Stamens 3 or rarely 2; filaments filiform, free, usually very short; anthers 1-celled. Rudimentary ovary small or none. Female flower: Staminodia 3 or none. Ovary 1-celled, with 1 pendulous ovule; styles 3 (rarely 2?), filiform, free or united to the middle, the free part stigmatic from near the base. Fruit narrow or ovoid, with a thin pericarp opening on one side, or with a thicker pericarp splitting at the angles. Stems simple or branched, leafless except the sheathing scales which are usually closely appressed and erect. Male and female inflorescences nearly similar or very different, in some species the spikelets in both sexes in narrow panicles, in others the males pedicellate and paniculate, the females sessile and clustered or spicate. Male spikelets always several-flowered with 1, 2 or rarely 3 outer empty glumes. Females various.

The genus like *Restio* is also represented in South Africa and New Zealand, but the Australian species appear to be all endemic. The males of some species are scarcely to be distinguished from those of some species of *Restio*, but the females are readily recognised.—*Benth.*

SECT. I. **Homœanthesis**.—Spikelets in both sexes very small, clustered along the branches of a long panicle.

Spikelets very densely clustered along the short branches of a long dense panicle.

Outer females perianth-segments erect, inner short, tomentose, closed over the ovary

1. *L. ramosus*.

Perianth-segments all equal narrow, glabrous

2. *L. elatior*.

Spikelets clustered along the few narrow branches of the panicle. Perianth-segments glabrous.

Stem glabrous

3. *L. spathaceus*.

Stem cottony-villous

4. *L. Schultzii*.

1. ***L. ramosus*** (branching), *R. Br. Prod.* 250; *Benth. Fl. Austr.* vii. 236. Rhizome unknown. Stems terete, erect, divided into a few long erect branches, above 2ft. high, and sometimes the flowering branches again much divided. Sheathing scales closely appressed, shortly acute, in some specimens perhaps diseased, imbricate at the ends of the branches. Spike-like panicles dense and numerous in a long narrow interrupted panicle. Male spikelets very numerous, small and sessile in clusters along the short branches. Glumes less than a line long, acutely acuminate, almost aristate, the upper ones scarcely exceeding the lower. Perianth-segments acuminate, glabrous, the inner ones rather broader and less acuminate than the outer. The flowers examined had only 4 segments and 2 stamens in *Dallachy's* as well as in *Fitzalan's* specimens but they may very probably be sometimes 3-merous. Female inflorescence the same as the male, but the spikelets still smaller and more densely clustered. Glumes and 3 outer perianth-segments scarcely $\frac{1}{2}$ line long, with fine points and glabrous or slightly ciliate, 3 inner segments shorter, obtuse, densely covered with a white woolly tomentum and closed over the glabrous ovary. Style filiform, divided to the middle into 3 or sometimes 2 stigmatic branches.—*F. v. M. Fragm.* viii. 92.

Hab.: Endeavour River, *Banks and Solander*; Rockingham Bay, *Dallachy*; Daintree River, *Fitzalan*.

2. ***L. elatior*** (tall), *R. Br. Prod.* 250; *Benth. Fl. Austr.* vii. 236. Rhizome unknown. Stems above 2ft. high, rather stout and undivided in the specimens seen. Sheathing scales closely appressed, acuminate. Male specimens not seen. Female spikelets very small and numerous, of a rich dark brown, very densely crowded on the short branches of a long panicle, the bracts under the sessile clusters and spikelets acuminate with long fine points usually exceeding the

spikelets. Spikelets about 1 line long and broad, the glumes acutely acuminate. Perianth-segments 6, under $\frac{1}{2}$ line long, all nearly equal and quite glabrous or minutely ciliate. Ovary glabrous. Styles 2 or 3, free from the base or nearly so. Fruit about $\frac{1}{2}$ line long, the pericarp readily splitting into 2 or 3.

Hab.: Gulf of Carpentaria, *R. Brown*; Daintree River, *Fitzalan*.

As observed in several other Restiaceæ some diseased inflorescences have larger flowers filled with the black granules of a fungus.—*Benth*.

3. **L. spathaceus** (spathe-like), *R. Br. Prod.* 250; *Benth. Fl. Austr.* vii. 236. Rhizome unknown. Stems erect, 2ft. high or more, divided into few rigid and erect or more numerous slender somewhat flexuose branches. Sheathing scales closely appressed, acute or shortly acuminate. Spike-like panicles narrow and not much branched, the small spikelets numerous and clustered along the branches. Males in the specimens seen too imperfect for examination. Female spikelets ovoid, about 1 line long. Glumes acutely acuminate, rather spreading. Perianth-segments 6, narrow-lanceolate, acutely acuminate, all glabrous. Style-branches 2 or 3. Pericarp thin.—*L. desertus*, *F. v. M. Fragm.* viii. 93.

Hab.: Gulf of Carpentaria, *R. Brown*.

The majority of specimens examined diseased with the fungus.—*Benth*.

4. **L. Schultzii** (after M. Schultz), *Benth. Fl. Austr.* vii. 237. Rhizome shortly creeping, densely woolly, emitting numerous slender almost filiform much branched barren stems under 1ft. high, and rigid erect simple or slightly branched flowering stems attaining 2ft. or more, densely and softly cottony-villous as well as the rhachis of the panicle. Male spike-like panicle slender, narrow, not much branched, the young spikelets narrow, $1\frac{1}{2}$ to 2 lines long. Glumes acuminate with scarious margins. Perianth-segments 5 or 6, the outer ones narrow and acuminate, the inner broader, thinner, and almost obtuse. Stamens 3. Females unknown.

Hab.: Cape York Peninsula.

4. HYPOLÆNA, *R. Br.*

(From *hypo*, under, and *chlaina*, a cloak.)

(*Calorophus*, *Labill.*; *Calostrophus*, *F. v. Muell.*)

Flowers dioecious, the males several together or rarely solitary, the females solitary, in spikelets with imbricate glumes and no bracteoles. Male flower: Perianth-segments 6, narrow, glume-like or thin. Stamens 3, filaments filiform; anthers 1-celled. Female flower: Perianth-segments 6 or 4, short broad and very thin, almost hyaline. Staminodia 3 or none. Ovary 1-celled, with 1 pendulous ovule; styles or style branches 2 or 3, filiform, stigmatic from below the middle. Fruit a small ovoid or obovoid indehiscent nut.—Stems usually much-branched and often flexuose, leafless except the sheathing scales which are persistent. Male spikelets either solitary or 2 together within distant bracts along the branches, or several in a terminal panicle. Females solitary or 2 or 3 together at the end of the branches.

Besides the Australian species of which one is also in New Zealand, there are several from South Africa.

SECT. I. **Calorophus**.—Male spikelets solitary or 2 together, 1-sessile, the other shortly pedicellate, within distant floral bracts.

Male spikelets several-flowered. Female spikelets terminal or sessile, 2 to

3 lines long 1. *H. lateriflora*.

SECT. II. **Euhypolæna**.—Male spikelets all pedicellate in a small panicle. Female spikelets terminal solitary or in clusters of 2 or 3.

Style-branches longer than the entire part 2. *H. fastigiata*.

TRIBE III. **Rhynchosporæ**.—*Spikelets capitate spicate or paniculate, rarely solitary or umbellate, with 1 rarely 2 (in Schoenus 2 to 6) hermaphrodite fertile flowers, and sometimes 1 or more male or sterile flowers above or below. Empty glumes at the base often more than 2. Hypogynous bristles or scales when present filiform or flat.*

(Flowers sometimes unisexual by abortion in 24 *Caustis*.)

- Spikelets small, in a dense ovoid spike or head, with 1 flower and 4 glumes, the inner one fleshy enveloping the nut. No hypogynous bristles. Low branching leafy plant 14. REMIREA.
- Spikelets in a small terminal head. Stamens or staminodia 6. No hypogynous bristles or scales 15. ARTHROSTYLES.
- Glumes imbricate all round. Style-branches 2. Nut crowned by the thickened persistent base of the style.
- Empty glumes several. Hypogynous bristles 6 or irregularly fewer, slender or small 16. RHYNCHOSPORA.
- Hypogynous bristles or scales 3. Spikelets in a terminal head 17. MESOMELENA.
- Glumes distinctly distichous. Style-branches 3, rarely 4.
- Flowers 2 to 6, all or the lower ones fertile. Rhachis between the flowers elongated curved or flexuose 18. SCHÆNUS.
- Flowers 1 or 2, both fertile or the lowest male or sterile. No hypogynous bristles. Spikelets in a narrow panicle or axillary 19. ELYNANTHUS.
- Glumes imbricate all round, or when few obscurely distichous. Style-branches 3, rarely 4 or 8.
- Hypogynous bristles small and not thickened under the nut 20. TRICOSTULARIA.
- Hypogynous scales often at first minute, thickened and acuminate under the nut 21. LEPIDOSPERMA.
- No hypogynous bristles or scales.
- Spike paniculate, when 2-flowered the lowest fertile, its glumes as long as the outer empty ones. Stamens 3 22. CLADIUM.
- Spikelets paniculate, when 2-flowered the lowest sterile; flowering glumes obtuse and shorter than the outer empty ones. Stamens 3 to 6 23. GAHNIA.
- Spikelets solitary or clustered in an irregularly branched inflorescence, when 2-flowered the lowest sterile, and often unisexual. Stamens 3 to 6. Nut crowned by the ovoid or oblong base of the style 24. CAUSTIS.

TRIBE IV. **Scleriæ**.—*Flowers strictly unisexual, in unisexual or androgynous spikelets. No utricle enclosing the females. Ovary and nut seated on a disk.*

- Single Australian genus 25. SCLERIA.

TRIBE V. **Caliceæ**.—*Flowers strictly unisexual, in unisexual or androgynous spikelets, the females enclosed in an utricle or perigynium.*

- Spikelets solitary, spicate or paniculate; unisexual or androgynous. Bristle within the utricle not exerted nor hooked and often deficient 26. CAREX.

1. CYPERUS, Linn.

(The derivation doubtful.)

(*Mariscus*, Vahl.; *Papyrus*, Willd.; *Diclidium*, Schrad.)

Spikelets with several often numerous flowers rarely reduced to 3, 2, or 1, all hermaphrodite or the terminal flower rarely male. Glumes distichous, concave or navicular and keeled, all nearly equal and flowering except the lowest 2 or 1 usually smaller and empty. No hypogynous scales or bristles. Stamens 3 or fewer. Style continuous with the ovary, not thickened at the base, deciduous, deeply or shortly divided into 2 or 3 filiform stigmatic branches or rarely almost or quite entire. Nut sessile, without any hypogynous disk, flattened biconvex or trigonous, smooth or (frequently in the same species) minutely granular.—Perennials either tufted or forming horizontal or creeping rhizomes, rarely annuals. Stems simple under the inflorescence. Leaves few at the base of the stem or rarely covering it half way up with their sheaths, long or short or sometimes all reduced to the sheaths, of which the lower ones are scale-like covering the rhizome or leaving annular scars when they fall away. Spikelets in clusters heads or spikes, very rarely solitary at the ends of the rays or branches of a simple or compound irregular umbel, sometimes occupying the whole of the secondary rays, the central clusters or spikes always sessile in the centre of the umbel, the

rays very unequal and sometimes the whole inflorescence contracted into a dense sessile compound cluster or head of spikelets, the general rhachis of the inflorescence rarely shortly produced, showing an interval between each ray. Under each ray is a persistent bract, one, two or more of the outer ones usually long and leaf-like forming an involucre round the inflorescence, the inner bracts and those which subtend the secondary rays and the spikelets usually small and scale-like, those under the spikelets rarely entirely wanting.

A very large and widely spread genus, second in the Order to *Carex* only in point of numbers, but much more prevalent than that genus in the tropical and subtropical regions both of the New and the Old World where it is everywhere abundant. It is represented also by a few species in more temperate regions, but quite disappears in the extreme north and south as well as on Alpine heights.

The genus differs from those groups of *Scirpus* which having no hypogynous bristles formed Brown's genus *Isolopis*, solely in the distichous arrangement of the glumes, and this character is not constant in *Cyperus pygmaeus*, whilst in *Scirpus cyperoides*, a West Australian species, the glumes are often very nearly distichous. From *Schenus* it is generally distinguished by the habit and inflorescence, the flowers more numerous in the spikelets, the flowering glumes more regularly distichous and the straighter rhachis of the spikelet, but none of these characters are absolutely constant. A few exceptional intermediates occur among the species of both genera. —Benth.

SECT. I. **Pycreus**.—Spikelets flat with navicular keeled glumes. Style usually 2-cleft. Nut more or less flattened, with one edge next the rhachis.

Nut ovate or obovate, not exceeding half the length of the glume.

Dwarf tufted annual. Spikelets in loose clusters in an umbel of 3 to 6 rays. Keel of the glumes produced into a straight or recurved point, the sides nerveless

1. *C. pumilus*.

Perennial mostly under 1ft. Spikelets 1 to 1½ line broad, in a single loose cluster or rarely 1 or 2 short umbel-rays. Glumes broad, obtuse, the sides dark or with a dark patch

2. *C. eragrostis*.

Annual or perennial much under 1ft. Spikelets 1 to 1½ line broad, few in the clusters in an umbel of few rays or all in one cluster. Glumes broad, obtuse, very pale or yellowish green

3. *C. flarescens*.

Perennial, mostly under 1ft. Spikelets narrow, in heads or clusters all sessile or in an umbel of few rays. Glumes rather narrow, almost acute, the sides of a pale brown

4. *C. globosus*.

Perennial, 1 to 2ft. Spikelets 2 lines broad, the clusters in an umbel of few rays. Glumes broad, rather acute, shining green or yellowish

5. *C. unioloides*.

Nut oblong, not exceeding half the length of the glume.

Spikelets narrow, very numerous, in a dense sessile compound cluster, rarely with 2 or 3 elongated umbel-rays

6. *C. polystachyus*.

Nut broad, almost as long as the glume. Tall perennial.

Spikelets loosely spicate and distichous along the rays of a large compound umbel

7. *C. flavicomus*.

SECT. II. **Juncellus**.—Spikelets flattened but usually thick. Style 2-cleft or rarely 3-cleft. Nut ovate or broad, with a flat or concave face next to the axis, the back convex or with a raised central angle.

Spikelets very numerous and closely packed in a small compound head with an involucre of long leafy bracts.

Dwarf annual. Involucre of several bracts. Pericarp not thickened

8. *C. pygmaeus*.

Perennial, often 1ft. high. Involucre of 2 very long bracts. Pericarp thickened at the base into a white prominent 2 or 3-lobed mass

9. *C. cephalotes*.

Spikelets in clusters in a dense umbel of several short rays. Style hairy

10. *C. platystylis*.

Spikelets small numerous, in dense spikes along the rays of a large compound umbel. Stems 3 to 4ft.

11. *C. alopecuroides*.

SECT. III. **Eucyperus**.—Spikelets flat, the rhachis not winyed or rarely with an exceedingly narrow border. Style 3-cleft. Nut equally triquetrous.

Spikelets numerous, in a single small dense globular head, with an involucre of long slender bracts

12. *C. pulchellus*.

Spikelets spreading, pale-coloured, in a single sessile cluster or solitary.

Glumes obtuse or very shortly pointed. Nuts short. (**Graciles**.)

Slender perennials. Spikelets or clusters terminal.

Glumes with 3 or 4 prominent nerves on each side and scarcely any nerveless margins

13. *C. gracilis*.

- Glumes with 1 or 2 nerves on each side near the keel and broad nerveless margins. Leaves almost filiform.
- Spikelets clustered. Nuts more than half the glume 14. *C. enervis*.
- Spikelets solitary or 2 together. Nuts scarcely half the glume 15. *C. debilis*.
- Glumes with 1 nerve on the middle of each side. Leaves linear, often 1 line broad 16. *C. laevis*.
- Spikelets numerous, clustered or capitate, the clusters or heads solitary or in an umbel of few rays. Glumes with a prominent straight or recurved point. Small annuals (**Squarrosi**.)
- Keel of the glumes ending in a short slightly recurved point, with a nerve on each side. Nuts narrow 17. *C. castaneus*.
- Keel of the glumes ending in a long recurved point, the sides nearly nerveless. Nuts rather broad 18. *C. cuspidatus*.
- Glumes 3 or 5-nerved, tapering into a long recurved point, without nerveless margins. Nuts broad 19. *C. squarrosus*.
- Spikelets dark-coloured, clustered or capitate in an umbel of few rays or clusters rarely solitary. Nuts broad, as long as the glume (**Migricantes**.)
- Spikelets small and numerous in dense globular heads. Glumes orbicular not $\frac{1}{2}$ line long 20. *C. difformis*.
- Spikelets spreading, in clusters of 3 to 6. Glumes above 1 line long 21. *C. tetraphyllus*.
- Spikelets pale or brown, clustered capitate or solitary on the rays of an umbel. Nuts broad, not above $\frac{1}{2}$ the glume (except *C. filipes*) (**Compressi**.)
- Involucral bracts few, unequal, 1 or 2 longer than the inflorescence or all short.
- Umbel-rays few. Stems weak. Spikelets oblong. Glumes acutely keeled, with 1 nerve in the middle of each side 22. *C. trinervis*.
- Umbel-rays numerous.
- Stems erect, very angular or flat. Spikelets small, linear, acute 23. *C. Haspan*.
- Stems angular. Spikelets about $1\frac{1}{2}$ line long, less the $\frac{1}{2}$ line broad 24. *C. flavidus*.
- Stems erect, leafy at the base. Spikelets very flat, ovate or oblong. Glumes brown with white edges 25. *C. concinnus*.
- Involucral bracts 6 or more long leafy and unequal. Umbel rays long numerous and slender.
- Spikelets solitary on each ray 26. *C. filipes*.
- Spikelets in clusters of 3 or 4 on each ray 27. *C. pedunculatus*.
- Involucral bracts about 6, nearly equal, rigid, erect or spreading.
- Umbel many-rayed or reduced to a dense cluster. Stem leafless 28. *C. vaginatus*.
- Spikelets pale or dark brown, clustered on the rays of an umbel. Nut narrow, nearly or quite as long as the glume (**Fulvi**.)
- Spikelets small and few-flowered, in little globular clusters in a compound umbel 29. *C. holoschaenus*.
- Spikelets very flat, long and narrow linear, clustered in a compound umbel. Glumes mostly obtuse 30. *C. dactylotes*.
- Spikelets very flat, linear, clustered in a simple umbel or compound cluster. Glumes tipped with fine points 31. *C. Gilesii*.
- Spikelets rather thick, oblong or lanceolate. Glumes obtuse or scarcely acute. Stems obtusely triquetrous.
- Spikelets 8 to 12-flowered. Glumes imbricate though rather loose 32. *C. fulvus*.
- Spikelets 10 to 30-flowered. Glumes spreading scarcely imbricate 33. *C. carinatus*.
- Spikelets of *C. carinatus*. Stems stout, acutely 3-angled. Involucral bracts 1 or 2 very long and scabrous 34. *C. alterniflorus*.
- Spikelets usually numerous, in loose spikes along the rays of a simple or compound umbel (**Ornati**.)
- Spikelets flat, usually pale, the rhachis of the spike minutely hairy 35. *C. pilosus*.
- Spikelets flat, of a rich brown. Glumes bordered by a scarious hyaline membrane 36. *C. ornatus*.
- Spikelets flat, pale brown or yellowish green, very irregularly spicate. Glumes very obtuse, loosely imbricate 37. *C. Iria*.
- Spikelets flat, pale, densely spicate. Glumes loosely imbricate, the keel produced into a short point 38. *C. eleusinoides*.
- Spikelets very narrow-linear, loosely spicate and spreading, the glumes very narrow and distant 39. *C. distans*.

SECT. IV. **Papyrus**.—Spikelets flat or terete, the rhachis bordered by scarious wings, either persistent or at length more or less detached as small scales. Glumes imbricate. Style 3-cleft. Nut equally triquetrous.

- Spikelets shortly spicate or clustered on the rays of a simple or compound umbel. Nut not exceeding half the length of the glume (**Corymbosi**.)
- Stems leafless or the sheaths bearing a very short lamina.
- Glumes keeled. Nut equally triquetrous. Stems continuous . . . 40. *C. corymbosus*.
- Stems leafy at the base.
- Spikelets rather flat, usually acute, shortly and rather loosely spicate or clustered . . . 41. *C. rotundus*.
- Spikelets 4 to 11 in the clusters, linear compressed, 10 to 16-flowered . . . 42. *C. tenuiflorus*.
- Spikelets linear, compressed. Stems 3-angled . . . 43. *C. lucidulus*.
- Spikelets slightly flattened, in very dense short spikes or clusters. Stems acutely 3-angled. Leaves rather broad with long points . . . 44. *C. congestus*.
- Spikelets very narrow, scarcely flattened, in dense clusters. Stems obtusely triquetrous. Leaves very narrow . . . 45. *C. subulatus*.
- Spikelets clustered or shortly spicate on the rays of a simple or compound umbel. Nut usually nearly as long as the glume (**Lucidi**.)
- Spikelets small, 5 to 8-flowered, in little globular clusters. Stems obtusely triquetrous . . . 46. *C. sporobolus*.
- Spikelets linear, scarcely flattened, 10 to 20-flowered, in close clusters or heads.
- Stems obtusely triquetrous. Spikelets usually few in the heads . . . 47. *C. angustatus*.
- Stems stout, acutely 3-angled. Spikelets numerous in the heads . . . 48. *Novæ Hollandiæ*.
- Spikelets flat, of a rich brown.
- Spikelets in globular clusters or heads, usually 8 to 12-flowered . . . 49. *C. Gunnii*.
- Spikelets distinctly spicate, mostly 5 to 8-flowered . . . 50. *C. lucidus*.
- Spikelets in lengthened spikes along the rays of a compound or rarely simple umbel.
- Spikelets flat. Glumes loosely imbricate. Nut more than half the length of the glume.
- Spikelets pale-coloured, 10 to 16-flowered, the rhachis scarcely winged . . . 38. *C. eleusinoides*.
- Spikelets of a rich-brown, 3 to 8-flowered, the rhachis distinctly winged . . . 50. *C. lucidus*.
- Spikelets flat. Glumes closely imbricate. Nut less than half the length of the glume (**Exaltati**.)
- Spikelets thick, $1\frac{1}{2}$ to 2 lines broad, pale-coloured, 4 to 8-flowered . . . 51. *C. pennatus*.
- Spikelets very flat, under 1 line broad, usually rich brown, 10 to 20-flowered . . . 52. *C. exaltatus*.
- Spikelets narrow, linear-terete, 10 to 20-flowered, loosely spicate, mostly under $\frac{1}{2}$ in. Glumes obscurely 3-nerved. Nut less than half the length of the glume . . . 53. *C. digitatus*.
- SECT. V. **Diclidium**.—Spikelets narrow, terete or nearly so, often flexuose, sometimes 1-flowered, the rhachis bordered by hyaline wings embracing the nuts. Flowering glumes distant, narrow, closely appressed to the rhachis. Style 3-cleft. Nuts triquetrous.
- Spikelets rather rigid, with 6 or more flowers, in elongated spikes in a large compound umbel . . . 54. *C. ferax*.
- Spikelets bearing 10 to 18-flowers . . . 55. *C. esculentus*.
- Spikelets almost subulate, with 6 or more flowers, in short close spikes in an umbel of few rays . . . 56. *C. Bowmanii*.
- Spikelets filiform, 3 or 4-flowered, in loose spikes in a large compound umbel . . . 57. *C. trichostachys*.
- Spikelets mostly 2 or 3-flowered, in ovoid globular spikes in a simple umbel of few rays. Stems smooth . . . 58. *C. leiocaulon*.
- Spikelets 1 or 2-flowered, in ovoid or cylindrical spikes in a compound umbel of many rays. Stems scabrous . . . 59. *C. scaber*.
- SECT. VI. **Mariscus**.—Spikelets small, numerous, terete or scarcely flattened, 1 or 2-flowered, the short enclosed rhachis bordered by hyaline wings. Flowering glumes imbricate when more than one. Style 3-cleft. Nut triquetrous.
- Spikelets usually with 2 perfect flowers, in small globular clusters in a compound umbel of many rays . . . 60. *C. decompositus*.
- Spikelets with 1 or rarely 2 perfect flowers, in loose cylindrical spikes in a compound umbel . . . 61. *C. Armstrongii*.
- Spikelets usually with 1 perfect flower, in dense cylindrical spikes either sessile or pedunculate in a simple umbel . . . 62. *C. umbellatus*.
- Spikelets usually with 1 perfect flower, in dense ovoid or 3-lobed heads in a simple umbel . . . 63. *C. conicus*.

1. ***C. pumilus*** (dwarfish), *Linn.*; *Kunth, Enum.* ii. 4; *Benth. Fl. Austr.* vii. 258. A dwarf tufted annual, the stem seldom above 3 or 4 in. high, the leaves mostly shorter and narrow. Umbel simple or slightly compound, of 3 to 6 slender rays, the longest 1 to 2 in. long, besides the sessile clusters. Spikelets 6 to 12 together, in loose clusters or short spikes. Involucral bracts generally 3, of which 1 or 2 longer than the inflorescence. Spikelets resembling those of *C. cuspidatus*, linear-lanceolate, very flat, rather acute, brown, 3 to 4 lines long and under 1 line broad, 16 to 20-flowered, the rhachis not winged. Glumes spreading, loosely imbricate or rather distant, the green keel with a prominent nerve on each side, produced into a short spreading or longer and recurved point, the brown scarious nerveless sides ending obtusely below the point. Stamens 2; or sometimes 1 only. Style 2-cleft. Nut obovate, biconvex, with 1 edge next the rhachis, less than half the length of the glume.—*C. nitens*, Vahl; Bœckel. in *Linnæa*, xxxv. 483; *C. breviculmis*, F. v. M. *Fragm.* viii. 267, not of R. Rr.

Hab.: Port Denison, *Fitzalan*; Rockhampton, *O'Shanesy*.

The species is widely spread over tropical Asia and Africa. Bœckeler is evidently right in uniting as one species the first five of Kunth's *Cyper*i, described under the names of *C. hyalinus*, *C. nitens* and *C. membranaceus*, Vahl., *C. punctatus*, Roxb. and *C. pumilus*, Linn. The Australian specimens belong to the var. *patens*, Bœckel. (*C. patens*, Vahl., not seen by Kunth), with looser spikes and rather narrower spikelets than in the commoner East Indian forms.—*Benth.*

2. ***C. eragrostis*** (Eragrostis-like), *Vahl*; *Kunth, Enum.* ii. 7; *Benth. Fl. Austr.* vii. 258. A perennial, flowering perhaps sometimes the first year, but forming short slender creeping or ascending rhizomes, and sometimes with the short tufted aspect of *C. flavescens*, differing from that species chiefly in the colour of the glumes. Stems mostly 6 in. to about 1 ft. high, but sometimes shorter or longer. Leaves shorter than the stem, all radical or extending nearly half way up. Spikelets either very few in a sessile cluster, or more numerous in a compound cluster or with 1 or 2 slightly elongated umbel rays each bearing a cluster. Involucre of 2 to 4 narrow bracts, 1 or 2 much longer than the inflorescence. Spikelets flat, dark brown or almost black, oblong or broadly linear, 3 to 6 lines long and about 1 line broad with about 12 to 24 flowers, the rhachis not winged. Glumes loosely imbricate, rather spreading, broad, obtuse with a more or less marked greenish keel, the sides nerveless, either a rich brown with narrow hyaline margins, or hyaline with a dark brown patch. Stamens usually 2. Style 2-cleft. Nut obovate, but varying much in breadth, biconvex or nearly flat, one edge next to the rhachis, less than half the length of the glume.—Bœckel. in *Linnæa*, xxxv. 443; F. v. M. *Fragm.* viii. 260; *C. areolatus*, R. Br. *Prod.* 216.

Hab.: Brisbane River, *Bailey*; Boyne River, *Hartmann*. A common southern species.

The species is widely distributed over East India, extending on the one hand to west tropical Africa, and on the other, more sparingly, to the Malayan Archipelago.

3. ***C. flavescens*** (yellowish), *Linn.*; *Kunth, Enum.* ii. 5; *Benth. Fl. Austr.* vii. 252. In the typical Mediterranean form usually a small tufted annual, but even there said by some to be perennial and, in the Australian specimens referred to it with some doubt, perhaps perennial and above 6 in. high. Leaves narrow, much shorter. Spikelets few together or rarely more numerous, in clusters in a simple umbel of 3 or 4 rays, or the whole reduced to a sessile cluster. Involucral bracts 2 or 3, of which 1 or 2 much longer than the inflorescence and narrow. Spikelets oblong or broadly linear, obtuse, flat, 3 to 4 lines long when fully out and 1 line or rather more broad, of a shining yellowish-green when fresh, pale in the dried specimens, 12 to 20-flowered, the rhachis not winged. Glumes very obtuse and rather broad, with 3 or 5 nerves closely adjoining in a broad dorsal keel, the sides nerveless. Stamens said to be 3, but 2 only in the upper or nearly all the flowers of some specimens. Style 2-cleft. Nut flat, ovate,

with one edge next the rhachis, about half the length of the glume.—Sibth. Fl. Gr. t. 47; Host. Gram. iii. t. 72; Reichb. Ic. Fl. Germ. t. 278; Bœckel. in Linnæa, xxxv. 488.

Hab.: Bowen Downs, *Birch*.

The typical form belongs to the Mediterranean region and chiefly to its western portion, but there are tropical African, Mascarene and a few East Indian specimens which, like the Australian one above mentioned, appear to be referable to the true *C. flavescens* rather than to the *C. globosus*. It is possible however that the Australian ones may prove to be an anomalous form of *C. eragrostis* without the dark colour on the glumes. The Brazilian *C. Olfersianus*, Kunth, is scarcely to be distinguished from the typical *C. flavescens*.—*Benth*.

4. *C. globosus* (globose), *All.*; *Bœckel. in Linnæa*, xxxv. 458; *Benth. Fl. Austr.* vii. 260. A tufted perennial, the stems from under 6in. to above 1ft. high. Leaves shorter, very narrow, sometimes almost setaceous, the lower sheaths often broad. Spikelets 3 or 4 together or frequently more numerous, in clusters in an umbel of 3 to 6 rays, either all short or the outer ones 1 to 2in. long, or the whole reduced to a single sessile cluster. Involucral bracts 2 or 3, of which 1 or 2 longer than the inflorescence. Spikelets linear or linear-lanceolate, flat, rather acute, pale or dark brown, from 4 to 6 lines long and scarcely 1 line broad, 12 to 40-flowered, the rhachis not winged. Glumes rather narrow, obtuse or almost acute, the keel pale-coloured, faintly 8-nerved, the sides brown, nerveless, sometimes with a light-coloured margin. Stamens usually 2. Style 2-cleft. Nut obovate or almost orbicular, biconvex with one edge next the rhachis, much less than half the length of the glume.—*Reichb. Ic. Fl. Germ.* f. 279; *C. vulgaris*, *Sieb. in Kunth, Enum.* ii. 4; *F. v. M. Fragm.* viii. 260; *C. flavescens*, *Thw. Enum. Ceyl. Pl.* 842, and other Indian authors.

Hab.: Lockyer and Brisbane River, *Hartmann*.

The species is widely distributed over tropical and temperate Asia, extending to the Mediterranean region, and is also in East tropical Africa and the Mascarene Islands.

5. *C. unioloides* (Uniola-like), *R. Br. Prod.* 216; *Benth. Fl. Austr.* vii. 260. A perennial, tufted or with a short creeping rhizome. Stems 1 to 2ft. high, triquetrous. Leaves flat but narrow, rather rigid, mostly shorter than the stem, with long brown sheathing bases. Umbel compound, of 3 to 6 rays, the longest 1 to 8in. long, the spikelets 4 to 12 together in clusters or short loose spikes. Involucral bracts 2 to 4, 1 usually much longer than the inflorescence. Spikelets oblong-lanceolate or almost ovate, flat but rather thick, 4 to 8 lines long and about 2 lines broad, of a shining yellowish-green or pale brown, 12 to 20-flowered, the rhachis not winged. Glumes broad, rather acute, with a prominent greenish keel, the sides smooth and nerveless. Stamens usually 3. Style 2-cleft. Nut broadly obovoid or orbicular, biconvex with one edge next the rhachis, much less than half the length of the glume.—*C. bromoides*, *Willd. MS.*; *Kunth, Enum.* ii. 8; *C. angulatus*, *Nees*; *Bœckel. in Linnæa*, xxxv. 465; *C. lanceus*, *F. v. M. Fragm.* viii. 259, not of *Thunb.*; *C. luteolus*, *Bœckel. in Flora*, 1875, 82 (from the character given).

Hab.: Shoalwater Bay, *R. Brown*; Brisbane River, *F. v. Mueller*.

The species extends over Nepaul and the eastern provinces of India, it is also in Brazil and in South Africa.

6. *C. polystachyus* (spikes numerous), *Rottb. Descr. et Ic. Pl.* 36, t. 11. f. 1; *Benth. Fl. Austr.* vii. 261. A tufted perennial. Stems from under 1ft. to above 2ft. high, triquetrous but not very stout. Leaves narrow, much shorter than the stem, with short broad sheaths. Inflorescence usually crowded into a dense sessile head or cluster with numerous spikelets, but sometimes forming a loose irregular umbel approaching that of some varieties of *C. rotundus*. Involucral bracts 2 to 4, of which 1 or 2 longer than the inflorescence. Spikelets narrow-linear, flat, rather acute, 4 to 6 lines long and under 1 line broad, usually pale-brown, 20 to 30-flowered, the rhachis angular and often slightly winged. Glumes

closely distichous, rather narrow, obtuse or with the keel produced into a short point, the sides indistinctly nerved. Stamens usually 2. Style 2-cleft or very rarely here and there 3-cleft. Nut narrow, biconvex, not half so long as the glume.—R. Br. Prod. 214; Kunth, Enum. ii. 18; Bœckel. in Linnæa, xxxv. 477; F. v. M. Fragm. viii. 265.

Hab.: Northumberland Islands, R. Brown; Sir C. Hardy Island, Henne; Cape York, Daemel; Rockingham Bay, Dallachy; Port Curtis, M'Gillivray; Brisbane River, Moreton Bay. F. v. Mueller; Rockhampton. A very common plant in all parts.

Var. *laxiflora*. Spikelets loosely clustered, often stipitate and almost racemose or corymbose in an umbel of 6 to 10 slender rays, the longest often 2 to 3 in. long. Nut rather broader.—*C. aquatilis*, F. v. M. Fragm. viii. 270, not of R. Br.

Hab.: Daintree River, Fitzalan; Rockingham Bay, Dallachy.

This variety has much resemblance with some of the looser flowered forms of *C. rotundus*, with small pale spikelets, but is readily distinguished by the style and nut. It may be a distinct species but is connected with the typical form by several Indian specimens. The species is common in the warmer regions of both the New and the Old World, extending northward to the Mediterranean and S. China in the Old World and to the Southern United States in America.—*Benth.*

7. *C. flavicomus* (head yellowish), Mich.: Kunth, Enum. ii. 15; *Benth. Fl. Austr.* vii. 261. A tall elegant perennial. Stems prominently 8-angled, 2 to 8 ft. high. Leaves much shorter, rather narrow. Umbel large and loose, often compound, the longer rays often 4 to 6 in. long, with numerous spikelets distichously spicate along the partial rays. Involucral bracts 3 or more, of which 1 or 2 much longer than the inflorescence, and the lowest sometimes 4 or 5 lines broad. Spikelets spreading, lanceolate, flat, $\frac{1}{2}$ to 1 in. long, and at length 2 lines broad, 12 to 20-flowered, the angles of the rhachis bordered by a narrow hyaline wing. Glumes spreading and quite distinct, giving the spikelet a pinnate appearance, broad, obtuse, the keel green, the sides smooth or pale and always bordered by a white hyaline margin. Stamens 3. Style 2-cleft. Nut broad, flat with 1 edge next the rhachis, nearly as long as the glume.—Bœckel. in Linnæa, xxxv. 470; *C. tremulus*, Poir.; Kunth, Enum. ii. 16; *C. Hochstetteri*, Nees; Bœckel. l.c. 471; *C. patuliflorus*, Bœckel. l.c. 478; *C. ornatisimus*, F. v. M. Fragm. viii. 265, ix. 54.

Hab.: Roxburgh Downs, Georgina River.

The species is also in the Indian Peninsula, in tropical Africa and the Mascarene Islands, and in Mexico and the southern United States of North America.

This section is fairly marked in character, but not very natural, the globose capitate inflorescence of the first two species is repeated in *C. pulchellus* and in *C. dubius* and some other Indian ones, the lateral inflorescence of *C. larigatus* is exceptional in the genus, *C. alopecuroides* has the habit nearly of *C. exaltatus*.

8. *C. pygmæus* (dwarfish), Rottb. Descr. et Ic. Pl. 20, t. 14, f. 4, 5; *Benth. Fl. Austr.* vii. 262. A densely tufted low annual, the stem usually under 6 in. high. Leaves mostly shorter and very narrow. Spikelets small and exceedingly numerous, densely crowded into a globular compound head not exceeding $\frac{1}{2}$ in. diameter. Involucral bracts 2 or 3, embracing the head by a broad base, with leafy points of 1 to 3 in., and often a few of the inner bracts leafy and protruding more or less from the head. Spikelets flat, ovate or oblong, about 2 lines or in luxuriant specimens nearly 3 lines long and 1 to $1\frac{1}{2}$ line broad, 12 to 20 or even more-flowered without any empty glumes at the base, but subtended by a glume-like bract, the rhachis not winged. Glumes pale green, shortly acuminate, prominently keeled, the sides more or less hyaline. Stamens usually 1 only. Style 2-cleft or rarely 3-cleft. Nut ovate, shorter than the glume, the broad flat inner face next the rhachis, the back convex or, when the style is 3-cleft, with a dorsal raised angle.—Kunth, Enum. ii. 18; Bœckel. in Linnæa, xxxv. 498; F. v. M. Fragm. viii. 268.

Hab.: Flinders River, F. v. Mueller; Mitchell.

The species is abundant in tropical and subtropical Asia and in the Mediterranean region, extending here and there into more temperate regions both in Europe and Asia, and reappearing in Mexico and Cuba.

9. **C. cephalotes** (capitate), *Vahl.*; *Kunth, Enum.* ii. 48; *Benth. Fl. Austr.* vii. 268. Stems from about 6in. to above 1ft. high. Spikelets small and numerous, densely crowded into a sessile globular or conical compound head about $\frac{1}{2}$ in. diameter. Involucral bracts with a lanceolate base, 2 or 3 very long, often above 1ft. Spikelets imbricate or at length spreading, pale coloured or varied with brown, flat, 2 to 3 lines long, and 1 to $1\frac{1}{4}$ line broad, 10 to 20-flowered, the short rhachis not winged. Glumes rather spreading, concave or navicular, obscurely several-nerved, the acutely prominent keel sometimes minutely ciliate. Stamens usually 2. Style undivided or unequally 2-cleft, rarely 3-cleft. Nut ovate, flattened, rather shorter than the glume, the broader inner face next the rhachis, the back convex, the lower part of the pericarp thickened into a white cellular mass projecting in 2 or 3 lobes up the angles of the upper thin seed-bearing part, and falsely described as an adnate perigynium.—*Anosporum monocephalum*, Nees; *Bœckel. in Linnæa*, xxxvi. 441; *F. v. M. Fragm.* viii. 272; *Cyperus Hookerianus*, *Thw. Enum. Ceyl. Pl.* 342.

Hab.: Rockingham Bay, *Dallachy*. Rather widely spread over E. India.

10. **C. platystylis** (style broad), *R. Br. Prod.* 241; *Benth. Fl. Austr.* vii. 264. Stems tufted, rather stout, not above 1ft. high. Leaves rather broad, shorter and mostly much shorter than the stem, with flattened acutely keeled sheaths. Umbel very compact, of about 6 rays, the longest under 1in. Spikelets 6 to 12 in the clusters. Involucral bracts 1 or 2 longer than the inflorescence and 1 or 2 short. Spikelets brown, flat but rather thick, 4 to 6 lines long, $1\frac{1}{4}$ line broad, acute, the rhachis not winged. Glumes very regularly distichous and imbricate, broadly concave, the lower ones obtuse, the upper ones acute, the keel slightly prominent sometimes produced into a short point, the nerves very faint. Style 2 or 3-cleft, flattened or triquetrous in the upper part, the angles ciliate. Nut oblong or oval-oblong, as long as the glume, the flat face next the rhachis, the back convex.

Hab.: Queensland, *F. v. Mueller*.

The style is quite that of *Fimbristylis*, all the other characters those of *Cyperus*.

11. **C. alopecuroides** (Alopecurus-like), *Rottb. Descr. et Ic. Pl.* 98, t. 8. f. 2; *Benth. Fl. Austr.* vii. 264. Stems tufted at the base, stout and triquetrous, attaining 3 or 4ft. Leaves shorter, rather numerous. Umbel large, compound but very irregular, the rays rigid, erect, the longer ones sometimes at least 6in. long, sometimes all short and compact, the spikelets very numerous, and densely crowded all round the rhachis, in cylindrical spikes of 1 to $1\frac{1}{2}$ in., occupying the whole or the greater part of the secondary rays. Involucral bracts several, the outer ones from a broad base sometimes 1 to 2ft. long, rarely all shorter than the inflorescence. Spikelets lanceolate, not very flat, mostly about 2 lines long and under 1 line broad, pale-coloured, 8 to 12-flowered, or rarely longer with more flowers, the rhachis angular but not winged. Glumes broad, concave, with several not very prominent nerves, the keel prominent in the upper part only, and often produced into a short spreading point. Stamens 2 or rarely 3. Style 2-cleft, 1 branch often very short, rarely 3-cleft. Nut obovate, scarcely half the length of the glume, much flattened, the broad inner face next the rhachis, the back convex or with a raised central angle.—*R. Br. Prod.* 217; *Kunth, Enum.* ii. 19; *Bœckel. in Linnæa*, xxxvi. 321; *F. v. M. Fragm.* viii. 268.

Hab.: Shoalwater Bay, *R. Brown*; *Gracemere*, *O'Shanesy*.

12. **C. pulchellus** (pretty), *R. Br. Prod.* 213; *Benth. Fl. Austr.* vii. 265. A small slender plant with the habit of *Kyllinga monocephala*, but probably annual. Stems rarely above 6in. high. Leaves much shorter, few and narrow or almost setaceous. Spikelets numerous, in a dense globular sessile head 3 to 4 lines diameter. Involucral bracts usually 3, spreading or reflexed, two of them much

longer than the head. Spikelets very flat, pale-coloured, ovate, rarely above 1 line long and nearly as broad, 8 to 12-flowered, the rhachis not winged. Glumes rather narrow, concave, spreading, obtuse, almost hyaline, the keel slightly prominent and one faint nerve on each side. Stamens usually 1 only. Styles 3-cleft. Nut oblong, obtuse, obtusely triquetrous, not quite half as long as the glume.—F. v. M. Fragm. viii. 271; *Sorostachys kyllingioides*, Steud. Syn. Glum. ii. 71; *Cyperus sorostachys*, Bœckel. in Linnæa, xxxv. 588.

Hab.: Gulf of Carpentaria, F. v. Mueller; Beef Creek, Leichhardt; Gainsford, Bourman.

The species is also in East India and the Malayan Archipelago.

18. **C. gracilis** (slender), R. Br. Prod. 213; Benth. Fl. Austr. vii. 265. Stems tufted, very slender, from under 6in. to nearly 1ft. high. Leaves filiform, shorter than the stem, with short brown sheaths. Spikelets usually 2 to 4 or rarely more together in a sessile terminal cluster or head. Involucral bracts usually 3, filiform slightly dilated at the base, the longest attaining several inches. Spikelets flat, oblong-lanceolate, 2 to 3 lines long, rather above 1 line broad, of a pale brown or green, with 8 to 12 or rarely more flowers, the rhachis not winged. Glumes rather broad, somewhat acute, and rather spreading at the point, with 3 or 4 prominent nerves on each side and scarcely any nerveless margins. Stamens usually 3. Style 3-cleft. Nut broad, prominently 3-angled, not much shorter than the glume.—F. v. M. Fragm. viii. 264.

Hab.: Rockingham Bay, Dallachy; Rockhampton, O'Shanessy; Dawson River, F. v. Mueller.

Var. ? *rigidella*. Leaves not so slender and rather more rigid.—Head of Boyd River, Leichhardt.

The species is also in New Caledonia.

14. **C. enervis** (nerveless), R. Br. Prod. 213; Benth. Fl. Austr. vii. 266. Stems tufted, slender, from under 6in. to nearly 1ft. high, with filiform leaves as in *C. gracilis*. Inflorescence the same except that the spikelets are rather more numerous and rather longer with 12 to 16 flowers. Glumes broad, loosely imbricate but not spreading, obtuse or the keel produced into a very short straight point, with 1 or rarely 2 prominent nerves on each side of the keel, the broad sides otherwise nerveless. Nut as in *C. gracilis* not much shorter than the glume.

Hab.: Rockingham Bay, Dallachy; East Coast, R. Brown; Brisbane River, herb. F. Mueller; and towards Wallangarra.

Var. *laxus*. The lateral spikelets sometimes pedunculate.—Between Stanthorpe and border of N.S.W.

15. **C. debilis** (weak), R. Br. Prod. 213; Benth. Fl. Austr. vii. 266. A slender tufted plant with setaceous leaves and involucral bracts, closely allied to *C. gracilis* and *C. enervis*, and possibly a variety of the latter. Spikelets solitary or rarely 2 together, very much like those of *C. enervis*. Glumes rather broad, with 1 or very rarely 2 nerves on each side of the keel and a rather broad nerveless margin. Nut broad, much shorter than the glume, acutely or at length obtusely 3-angled, more or less distinctly marked with fine longitudinal striæ.

Hab.: Sometimes met with towards the Tweed River.

16. **C. lævis** (smooth), R. Br. Prod. 213; Benth. Fl. Austr. vii. 267. Not so slender as in *C. enervis*. Stems 1ft. high or rather more, acutely triquetrous. Leaves often above 1 line broad, with thickened nerve-like edges or inflexed margins. Spikelets 6 to 8 or more in a dense sessile cluster, spreading, pale-coloured, flat, 3 to 4 lines long and about 1 broad when fully out, 10 to 20-flowered, the rhachis not winged. Glumes spreading, rather broad, the keel prominent and sometimes produced into a very short point, the sides nerveless

and sometimes with a dark spot or with a not very prominent nerve in the centre as in *C. trinervis*. Stamens 2 or 3. Style 3-cleft. Nut ovoid-triangular, about half the length of the glume.

Hab.: Maroochie River, *Bailey*.

Bentham states that this species may possibly prove to be a variety of *C. trinervis* with the inflorescence of *C. enervis*, but the habit is somewhat different from both.

17. **C. castaneus** (chestnut-coloured), *Willd.: Kunth, Enum. ii. 21; Benth. Fl. Austr. vii. 367*. A small tufted annual, the stems rarely above 4 in. high and sometimes under 1 in. Leaves setaceous, shorter or rarely longer than the stem. Spikelets numerous, in dense clusters either solitary and sessile, or 2 or 3 lateral ones on peduncles or umbel-rays of $\frac{1}{2}$ to $\frac{3}{4}$ in. Involucral bracts 2 to 4, setaceous, mostly longer than the inflorescence. Spikelets linear, flat, of a rich brown, 4 to 6 lines long and scarcely above $\frac{1}{2}$ line broad, about 12 to 20-flowered, the rhachis not winged. Glumes rather narrow, the very prominent keel produced into a recurved point, shorter however than in the two following species, with a more or less distinct nerve on each side, the sides or marginal appendages nerveless, brown, terminating often abruptly below the recurved point. Stamen usually 1. Style 3-cleft. Nut narrow-oblong, obtusely 3-angled, more than half the length of the glume.—*Bæckel. in Linnæa. xxxv. 496; C. squarrosus var. stenocarpus, F. v. M. Fragm. viii. 262*.

Hab.: Dry Beef Creek, *Leichhardt; Camooweal, T. P. Keys*.

The species is in the East Indian Peninsula, in Ceylon, and in Sikkim.

18. **C. cuspidatus** (cuspidate), *H. B. et K.; Kunth, Enum. ii. 23; Benth. Fl. Austr. vii. 267*. A small tufted annual, resembling *C. castaneus* and *C. squarrosus* in habit, but the clusters of spikelets not so dense, and the glumes different. Stems mostly 2 to 4 in. long. Leaves very narrow or setaceous, sometimes as long as or longer than the stem. Clusters of spikelets solitary and sessile or in an umbel of few rays. Involucral bracts 2 or 3 longer than the inflorescence. Spikelets linear, spreading, from a pale green to a rich brown, 3 to 4 lines long, scarcely above $\frac{1}{2}$ line broad, with 12 to 20 or even more flowers, the rhachis not winged. Glumes rather narrow, prominently 3-nerved, the keel or dorsal nerve produced into a long recurved or spreading point, the sides bordered by a nerveless brown or hyaline margin terminating often abruptly below the recurved point. Stamen usually 1. Style 3-cleft. Nut obovoid but narrower than in *C. squarrosus*, prominently 3-angled.—*Bæckel. in Linnæa, xxxv. 496; C. squarrosus, F. v. M. Fragm. viii. 262*, but not of Linn., and not the var. *stenocarpus*.

Hab.: King's Creek and Herbert Creek, *Bowman*.

The species is widely spread over tropical Asia and Africa, extending northwards to S. China, and is also abundant in South and Central America east of the Andes.

19. **C. squarrosus** (squarrous), *Linn. Amen. Acad. iv. 308 and Spec. Pl. 66 excl. syn. Pluken.; Benth. Fl. Austr. vii. 268*. A small tufted annual, the stem rarely above 4 in. and sometimes under 1 in. high. Leaves mostly shorter than the stem, in some specimens $1\frac{1}{2}$ line broad and tapering to a fine point, in others very narrow from the base. Spikelets numerous, in dense ovoid or globose heads either solitary and sessile or in an umbel of few rays, rarely 1 in. long. Involucral bracts 3 or 4, of which 1 or 2 much longer than the inflorescence. Spikelets flat, oblong or linear, 2 to 3 lines long, 10 to 20-flowered, the rhachis not winged. Glumes rather narrow, 5 or 7-nerved, tapering into a long recurved point, without any or scarcely any nerveless margin. Stamen usually 1. Style 3-cleft. Nut narrow-obovoid or oblong, prominently 3-angled, varying from rather broad and under half the length of the glume, to narrow and longer than the half.—*C. aristatus, Rottb. Descr. et Ic. Pl. 23, t. 6, f. 1; Kunth, Enum. ii.*

23; Boeckel. in Linnæa, xxxv. 500; *C. inflexus*, Muehl.; Kunth. l.c. 22; F. v. M. Fragm. viii. 262; *C. uncinatus*, R. Br. Prod. 215; *C. Brownii*, Steud. Syn. Glum. ii. 53.

Hab.: Gulf of Carpentaria, *F. v. Mueller*; Endeavour River, Banks and Solander; various localities in North Queensland, Armitage, Wuth; beyond Mount Murchison, Bonney.

Var. *congestus*. Spikelets few-flowered, very densely crowded in nearly globular heads.—Dry Beef Creek, Leichhardt.

Var. *cylindraceus*. Spikelets 3 to 6-flowered, in dense oblong-cylindrical heads under $\frac{1}{2}$ in. long.—*C. aristatus*, F. v. M. Fragm. viii. 261.—Port Denison, herb. *F. Mueller*; Rockhampton and Herbert's Creek, Bowman.

The species is widely spread over East India, tropical Africa, North America and Mexico, extending down the Pacific side of the Andes to Chili, but not in South America east of the Andes.

20. ***C. difformis*** (2-formed), Linn.; Kunth. Enum. ii. 38; Benth. Fl. Austr. vii. 268. Stems tufted, 6 in. to 1½ ft. high, rather slender. Leaves sometimes as long as the stem but usually shorter, and sometimes all reduced to loose sheaths. Spikelets very numerous, in dense globular heads of $\frac{1}{4}$ to $\frac{1}{2}$ in. diameter, the heads in a loose umbel of few rays, rarely contracted into a compound cluster, the rays usually slender. Involucral bracts 1, 2 or 3, very variable in breadth. Spikelets narrow-linear, flat, $1\frac{1}{2}$ to 2 lines long, remarkable for the numerous very small almost orbicular and very obtuse glumes, at first of a rich brown, but becoming very variegated by their pale or almost white margins, the rachis not winged. Stamens 1 or 2. Style 3-cleft. Nut obovoid, acutely 3-angled, as long as the glume or nearly so.—Rottb. Descr. et Ic. Pl. t. 9, f. 2; Sibth. Fl. Gr. t. 46; Reichb. Ic. Fl. Germ. t. 284; Boeckel. in Linnæa, xxxv. 586; R. Br. Prod. 215; F. v. M. Fragm. viii. 262.

Hab.: Keppel Bay, *R. Brown*; Rockingham Bay, *Dallachy*; Rockhampton, Bowman, Thozet, O'Shaney and others; Moreton Bay, *F. v. Mueller* and others; Stanthorpe.

Widely spread over the tropical and subtropical regions of the Old World, extending northwards to the Mediterranean region.

21. ***C. tetraphyllus*** (4-leaved), R. Br. Prod. 214; Benth. Fl. Austr. vii. 269. Stems tufted or from a creeping rhizome, rather slender but usually rigid, triquetrous, 1 to 1½ ft. high. Leaves shorter or longer, flat, obtuse or acute, but less contracted into a point than in most species. Spikelets in clusters of 3 to 6, in an umbel of few or rarely rather numerous rays, the longest 2 to 3 in. rarely reduced to a single cluster. Involucral bracts narrow and tapering into long points, 1, 2 or 3 much longer than the inflorescence. Spikelets almost black but variegated with white when the nuts show beyond the glumes, linear-lanceolate, more or less flattened, 3 to 6 lines long, about 1 line broad, 6 to 20-flowered, the rachis not winged. Glumes rather broad, concave, faintly several-nerved, obtuse or the keel prominent in the upper part only and produced into a very short point. Stamens usually 3. Style 3-cleft. Nut broadly triangular, more or less dorsally compressed, as long as the glume and at length protruding on each side.—Kunth, Enum. ii. 27; Sieb. Agrostoth. n. 22; F. v. M. Fragm. viii. 264.

Hab.: Brisbane River, Moreton Bay, *F. v. Mueller*, Leichhardt, *C. Stuart* and many others. A scrub species.

22. ***C. trinervis*** (3-nerved), R. Br. Prod. 213; Benth. Fl. Austr. vii. 269. A perennial or sometimes annual. Stems weak and slender, from under 6 in. to 1 ft. long below the inflorescence. Leaves flat but not above 1 line broad, the longest often nearly as long as the stem, but sometimes all reduced to sheathing scales with or without a very short lamina. Spikelets in clusters of 3 or 4 or rarely more, in a simple or irregularly compound umbel of a few slender rays, the longest sometimes 4 to 6 in. long, sometimes all under 1 in. or the inflorescence reduced to a sessile compound cluster. Involucral bracts usually 3, of which 1 or 2 longer than the inflorescence, but sometimes all short. Spikelets

linear or oblong, very flat, pale coloured, in some specimens 2 to 3 lines long and 8 to 12-flowered, in others lengthening to 6 to 9 lines with numerous flowers, and at length appearing pedicellate from the fall of the lower glumes, usually about 1 line broad or rather more, the rhachis not winged. Glumes rather broad, short, regularly spreading, giving the spikelet a pinnate appearance, more or less acuminate, the keel acutely prominent, with 1 more or less conspicuous nerve in the middle of each side. Stamens 2 or 3. Style 3-cleft. Nut rather broad, acutely or at length obtusely 3-angled, not half so long as the glume.—Bœckel. in Linnæa, xxxv. 508; *C. flaccidus*, R. Br. l.c.; Bœckel. l.c. 502; F. v. M. Fragm. viii. 267; *C. imbecillis*, *C. aquatilis*, *C. inundatus*, and *C. breviculmis*, R. Br. l.c. 213, 214; *C. Lessonianus* and *C. macellus*, Kunth, Enum. ii. 29, 30, according to Bœckeler.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*; Endeavour River, *Banks and Solander*, *A. Cunningham*; Shoalwater Bay, *R. Brown*; Rockingham Bay, *Dallachy*; Lizard Island, *M'Gillivray*; Rockhampton and numerous localities in S. Queensland, *Thozet*, *Bowman*, *Leichhardt*, *F. v. Mueller* and many others.

I do not quite identify this species with any extra Australian one, but it is very closely allied to *C. compressus*, which is common in tropical and subtropical regions. It is exceedingly variable in stature, in the degree of development of the inflorescence and in the number of flowers in the spikelets and consequently their shape. I have been unable to distribute the numerous forms before me into distinct varieties, but generally may be placed in two series; one with long narrow spikelets and numerous flowers would include *C. aquatilis*, *C. imbecillis* and *C. trinervis*, Br., the other often a smaller or more slender plant, with broader shorter spikelets, fewer flowers and more spreading glumes would include *C. flaccidus*, *C. inundatus* and *C. breviculmis*. One of Cunningham's Endeavour River specimens looks at first sight very different, from the spikelets being only $1\frac{1}{2}$ to 2 lines long and 1 line broad with 8 to 12 flowers. A few specimens from Rockhampton have remarkably long spikelets with numerous flowers. All have the same pale 3-nerved glumes, though the lateral nerve is sometimes scarcely prominent.—*Benth.*

23. **C. Haspan** (a misprint for "Halpan," Hermann's Sinhalese name for the plant, *Trin. Fl. Ceyl.* v. 26), *Linn.*; *Kunth, Enum.* ii. 34; *Benth. Fl. Austr.* vii. 270. Stems tufted or shortly creeping, 6in. to above 1ft. rarely 2ft. high, acutely 3-angled, or flat but usually weak. Leaves all reduced to sheathing scales, or with a flat lamina shorter than the stem. Spikelets small, few together in loose clusters in a simple or compound umbel of slender usually numerous rays, the longest 2 to 3in. long or sometimes all short. Involucral bracts 2 or 3, shorter than the inflorescence or one rather longer, flat and rather broad. Spikelets linear, flat, acute, 2 or at length 3 or even 4 lines long, scarcely $\frac{1}{2}$ line broad, of 12 to 20 or rarely more flowers, the rhachis not winged. Glumes appressed but loosely imbricate, narrow, obtuse, or with the prominent keel produced into a short point, the sides brown or pale, obscurely nerved. Stamens usually 3. Style 3-cleft. Nut obovoid or almost globular, obtusely 3-angled, less than half the length of the glume.—*Rottb. Descr. et. Ic. Pl. t. 6, f. 2*; Bœckel. in Linnæa, xxxv. 574; F. v. M. Fragm. viii. 260; *Scirpus autumnalis*, *Rottb. Descr. et Ic. Pl. 58, t. 17, f. 8*, not of Linn.; *Cyperus pulcherrimus*, Willd.; *Kunth, Enum.* ii. 85; Bœckel. in Linnæa, xxxv. 573; *C. platyculmis*, R. Br. Prod. 214, altered to *C. laticulmis*, *Spreng. Syst.* i. 228.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*; Cape York, *Daemel*, *M'Gillivray*; Lizard Island, *M'Gillivray*; Rockingham Bay, *Dallachy*; Rockhampton and neighbourhood, *Bowman* and others; Moreton Bay, *F. v. Mueller*. *C. Stuart* and others.

Abundant in the tropical regions of the New and the Old World, extending northwards in America to Florida, New Orleans and Mexico.

24. **C. flavidus** (yellow), *Retz. Obs.* v. 13; *Trimen's Fl. Ceyl.* v. 27. A slender annual the stems 6 to 18in. high, stout or slender, trigonous, soft, the leaves shorter than the stems, erect narrow-linear, 1 to 6 lines broad, flat, 1-veined. Umbels compound or decomposed, rays many, spreading, primary, 1

to 8 in. long, secondary $\frac{1}{2}$ to 1 in. long, bearing heads of stellately spreading minute spikelets. Bracts 2 to 3, 1 or 2 attaining the length of 6 in. Spikelets about $1\frac{1}{2}$ line long, less than $\frac{1}{2}$ line broad; rhachis stout not winged. Glumes loosely imbricate, orbicular, hyaline with a broad green triangular, obscurely 3-veined central area. Stamen 1 rarely 2, anther linear, mucous. Nut minute, not $\frac{1}{2}$ the length of the glume, shortly and stoutly stipitate, globosely obovoid, trigonous, white or marbled with white. Style as long as the nut. Stigmas 3, capillary.

Hab.: Inland, near the border of N.S.W., *F. v. Mueller*.

Found in warmer regions of the Old World.

25. **C. concinnus** (neat), *R. Br. Prod.* 214; *Benth. Fl. Austr.* vii. 271. Stems rather slender, from under 1 ft. to $1\frac{1}{2}$ ft. high. Leaves narrow but sometimes as long as the stem. Spikelets in clusters of 3 or 4, in a compound umbel of numerous slender but rather short rays. Involucral bracts 3 or 4, very narrow, 1 or 2 of them longer than the inflorescence. Spikelets very flat, of a rich brown but bordered by the light-coloured tips of the glumes, ovate-oblong or at length oblong-linear, 2 to 3 or rarely 4 lines long, usually above 1 line broad, with 12 to 20 or rarely more flowers, the rhachis prominently notched but not winged. Glumes neatly imbricate, obtuse or almost acute, with prominent almost hyaline keels and margins, the sides otherwise dark brown with inconspicuous nerves, or rarely wholly hyaline and only appearing brown from the anthers showing through. Stamens 3 with short filaments. Style 3-cleft. Nut broadly triquetrous much less than half the length of the glume.—*F. v. M. Fragm.* viii. 261.

Hab.: Broadsound and Shoalwater Bay, *R. Brown*; Port Curtis, *Beckler*; Rockhampton and Brisbane River and various other localities.

26. **C. filipes** (stalklets thread-like), *Benth. Fl. Austr.* vii. 271. Stems triquetrous, rigid, 1 to 3 ft. high, leafless in the specimens seen except a single sheath at the base with a flat erect obtuse lamina of about 2 in. Spikelets single on the filiform rays of a compound umbel, the primary rays numerous mostly 4 to 8 in. long, 1 or 2 spikelets sessile or nearly so in the centre of the umbel. Involucral bracts about 8, mostly about as long as the rays and 2 or 3 lines broad, 1 or 2 short and narrow. Spikelets linear, flat, 3 to 5 lines long and scarcely 1 line broad, brown, 20 to 30-flowered, the rhachis prominently notched but not winged. Glumes rather broad, obtuse or shortly and obtusely acuminate, the keel not very prominent, the sides 3 or 4-nerved without nerveless margins, 4 or more of the lower ones usually smaller and empty. Stamens 3, on short filaments. Style 3-cleft. Nut ovoid-oblong, obtusely 3-angled or dorsally flattened, as long as or longer than the glume.

Hab.: Towards Wallangarra.

Notwithstanding the long nut this species appears to be most nearly allied to the following.—*Benth.*

27. **C. pedunculatus** (peduncles long), *F. v. M. Fragm.* viii. 266; *Benth. Fl. Austr.* vii. 272. Stems rather stout, triquetrous, from about 6 in. to $1\frac{1}{2}$ ft. high. Leaves few, longer than the stem, flat, 3 to 4 lines broad. Spikelets in clusters of about 3 or 4, in a simple or slightly compound umbel of 6 to 12 rays, the longest 3 to 8 in. long. Involucral bracts 5 or 6 or sometimes more, as broad as or broader than the stem-leaves, and 1 to 3 of them much longer than the inflorescence. Spikelets linear-lanceolate, flat, green or light-brown, 4 to 9 lines long, $1\frac{1}{2}$ line broad, with about 20 to 30 flowers, the rhachis prominently notched but not winged. Glumes lanceolate, incurved, loosely but regularly imbricate,

not spreading, the keel prominent, the sides nerveless or very faintly several-nerved. Stamens 8, with short filaments. Style 8-cleft. Nut broad, prominently 8-angled, much less than half the length of the glume.

Hab.: Rockingham Bay, *Dallachy*.

28. **C. vaginatus** (sheathed), *R. Br. Prod.* 213; *Benth. Fl. Austr.* vii. 272. Stems from a horizontal or creeping rhizome, rigid terete or slightly striate, 1 to 3 feet high, leafless except a few brown sheaths at the base, the innermost of which sometimes 3 to 4 in. long with a short erect lamina. Spikelets numerous in dense globular heads of about $\frac{3}{4}$ in. diameter when fully out, in a simple umbel of several often many rays of $\frac{1}{4}$ to $1\frac{1}{2}$ in. or the inflorescence contracted into a sessile compound cluster. Involucral bracts usually 5 or 6, more nearly equal than in any other species, erect or spreading, usually rigid, 1 to 8 in. long. Spikelets very flat, of a rich brown, oblong lanceolate or linear, about 1 line broad, varying from 2 to 3 lines long with 12 to 20 flowers to 4 to 6 lines with 40 to 50 flowers, the rachis not winged. Glumes closely imbricate but spreading, acute, the keel prominent and pale coloured, the sides brown and nerveless. Stamens 2 to 3. Style 8-cleft. Nut very prominently 8-angled, rather broad, acute, less than half the length of the glume.—*Bœckel. in Linnæa*, xxxv. 572.

Hab.: Plains of the Condamine, *Leichhardt*, and various other southern localities.

29. **C. holoschœnus** (like a *Schœnus*), *R. Br. Prod.* 215; *Benth. Fl. Austr.* vii. 278. Stems from a thick horizontal or creeping rhizome, 1 to 2 ft. high, obtusely 8-angled. Leaves rather narrow, sometimes nearly as long as the stem. Spikelets small, in dense globular clusters or heads 2 to 3 lines diameter, in an irregularly compound umbel of 4 to 8 or even more rays, the longest 2 to 3 in. long. Involucral bracts 3 or 4, narrow, 1 to 2 of them longer than the inflorescence, the heads or clusters subtended by glume-like bracts. Spikelets flat, pale brown, shortly lanceolate or oblong, 1 to $1\frac{1}{2}$ line long, and fully 1 line broad, with 5 to 8 or rarely more flowers, the rachis not winged or with an exceedingly narrow border. Glumes loosely imbricate, obtuse or almost acute, of a thin pale texture, striate with 2 or 3 fine nerves on each side. Stamens 3. Style 8-cleft. Nut obtusely 8-angled, nearly or quite as long as the glume.—*F. v. M. Fragm.* viii. 262.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*; Norman and Gilbert Rivers, *Gulliver*; Barcoo Downs, *Birch*.

30. **C. dactylotes** (rays finger-like), *Benth. Fl. Austr.* vii. 273. Stems usually rather stout and 2 to 3 ft. high, but sometimes more slender and scarcely above 1 ft., terete or obtusely 8-angled. Leaves rather long. Spikelets numerous in dense clusters or heads, in a usually compound but very variable umbel, the longest rays often 6 in. long, the partial umbels very dense. Involucral bracts several, of which 2 to 4 longer than the inflorescence, and 2 to 4 lines broad at the base. Spikelets linear, flat, very regular, usually 6 to 9 lines but sometimes at least 1 in. long, scarcely 1 line broad, of a light brown sometimes almost golden colour, with 30 to 50 or even more flowers, the rachis not winged. Glumes loosely imbricate, not very broad, obtuse or the keel produced into a minute point, the sides more or less distinctly 2 or 3-nerved, without scarious margins. Stamens 3. Style 8-cleft. Nut narrow, 8-angled, nearly as long as the glume.

Hab.: Maranoa, *Woolfs*; Barcoo Downs, *Schmidt*, *Birch*; Armadilla, *Barton*.

31. **C. Gilesii** (after *Christo. Giles*), *Benth. Fl. Austr.* vii. 274. Stems 6 in. to 1 ft. high, slender, slightly triquetrous. Leaves much shorter. Spikelets in dense clusters in a simple umbel of about 6 rays, the longer ones about 1 in. long, or the whole inflorescence condensed into a compound sessile cluster. Involucral

bracts few, of which 1 or 2 longer than the inflorescence. Spikelets linear or linear-lanceolate, very flat, elegantly pinnate, of a pale brown, $\frac{1}{2}$ to nearly lin. long, above 1 line broad, 20 to 40-flowered, the rhachis slender, not winged. Glumes loosely but regularly distichous, narrow, obtuse, but the pale-coloured or almost hyaline keel produced into a fine straight or recurved point, the sides very prominently 2 or 3-nerved, the lower glumes very deciduous, giving the older spikelets a pedicellate appearance, the 2 small ovate empty glumes remaining persistent at the base of the rhachis. Stamens 8. Style 3-cleft. Nut linear-oblong, more than half the length of the glume.

Hab.: Mitchell District, *F. v. Mueller.*

82. **C. fulvus** (tawny), *R. Br. Prod.* 215; *Benth. Fl. Austr.* vii. 274. Stems from under 1ft. to above 2ft. high, obtusely 3-angled. Leaves narrow, sometimes as long as the stem. Spikelets 6 to 12 together in dense heads or clusters in a simple or compound umbel of 5 to 10 rays, the longest rarely 2in. long. Involucral bracts 2 usually longer than the inflorescence and sometimes very long, with 1 or 2 short ones. Spikelets very spreading, linear-lanceolate, rather acute, flat but rather thick, of a golden brown or pale-coloured, 2 to 3 or rarely 4 lines long, about 1 line broad, 8 to 12-flowered, the rhachis not winged. Glumes loosely imbricate or at length rather spreading, narrow, obtuse, or almost acute, with 2 or 3 prominent nerves on each side of the keel. Style 3-cleft. Nut oblong, 3-angled, more than half the length of the glume.—*F. v. M. Fragm.* viii. 268; *C. Sieberi*, Kunth, Enum. ii. 96.

Hab.: East Coast, *R. Brown*; Port Denison, *Fitzalan*; Rockhampton and many various southern localities.

83. **C. carinatus** (keeled), *R. Br. Prod.* 216; *Benth. Fl. Austr.* vii. 274. Stems 6in. to 1½ft. high, obtusely triquetrous. Leaves much shorter, crowded in the tufts, rather broad, tapering to a fine point. Spikelets in dense clusters or heads in an umbel of few rays, the longest 1 to 2in. long. Involucral bracts 3 or 4, of which 1 or 2 longer than the inflorescence and 1 often very long. Spikelets spreading, linear or linear-lanceolate, flat but rather thick, with a loose pinnate aspect, 4 to 6 lines long or when old rather longer, nearly 2 lines broad, 10 to 30-flowered, the rhachis not winged or scarcely perceptibly bordered. Glumes not closely imbricated, short and rather broad, spreading, obtuse, the keel prominent and often produced into a short straight or recurved point, the sides 3 or 4-nerved. Stamens 8. Style 3-cleft. Nut obovate-oblong, 3-angled, more than half the length of the glume.

Hab.: Between Norman and Gilbert Rivers, *Gulliver*; Springsure, *Wuth.*; Wallangarra.

The species is very near *C. fulvus*, but the glumes are much shorter and broader as well as looser in the spikelets, giving the inflorescence a very different aspect approaching that of *C. alterniflorus*.—*Benth.*

84. **C. alterniflorus** (alternate flowers), *R. Br. Prod.* 216; *Benth. Fl. Austr.* vii. 275. Stems rather stout, acutely 3-angled, 2 to 3ft. high. Leaves often longer than the stem, 2 to 4 lines broad at the base, with very scabrous edges. Spikelets densely clustered as in the preceding species, but the common rhachis often slightly elongated, the clusters becoming short dense spikes, in a compound umbel of 6 to 10 rays, the longest 3 to 4in. long, or all short and dense. Involucral bracts 1 or 2 very long, sometimes near 2ft. and very scabrous like the leaves, with 1 or 2 short ones. Spikelets spreading, of a rich or a pale brown, linear, flat, 4 to 10 lines long, nearly 1½ line broad, 10 to 30-flowered, the rhachis not winged. Glumes narrow, spreading and very loosely imbricate, rather acute, the keel prominent, with 3 or 4 nerves on each side. Stamens 2 or

8. Style usually 8-cleft. Nut narrow, 8-angled, more than half the length of the glume.—*C. pictus*, Steud. Syn. Glum. ii. 48.

Hab.: Shoalwater Bay, *R. Brown*; Gracemere, *O'Shanesy*; King's Creek, *Bowman* (with spikelets above 1in. long and 50 to 60-flowered).

The species is allied to *C. carinatus* but readily known by the stature, acute-angled stem and long scabrous leaves and involucre bracts.

35. **C. pilosus** (hairy), *Vahl*; *Kunth, Enum.* ii. 80; *Benth. Fl. Austr.* vii. 275. Stems from a thick rhizome 1 to 2ft. high or rather more, stout and acutely 8-angled. Leaves sometimes as long as the stem and rather broad. Spikelets loosely spicate along the upper part of the rays of a rather compact umbel of 7 to 10 or more rays, the longest 2 to 3in. long, the rhachis of the spikes angular and minutely hairy, the only instance of pubescence observed in the genus. Involucre bracts 4 or 5, of which 1 often very long and the 2 outer ones broad. Spikelets very spreading, of a pale-brown, flat, linear-lanceolate, about 4 lines long, 10 to 16-flowered, the rhachis not winged or the angles with an exceedingly narrow border. Glumes pinnately spreading, rather acute, with a green keel and usually 2 nerves on each side. Style 8-cleft. Nut broad, acutely 8-angled, less than half the length of the glume.—*Bœckel. in Linnæa*, xxxv. 598; *F. v. M. Fragm.* viii. 260.

Hab.: Brisbane River, *F. v. Mueller*. Widely spread over tropical Asia.

36. **C. ornatus** (adorned), *R. Br. Prod.* 217; *Benth. Fl. Austr.* vii. 276. Stems rather stout, 1 to 3ft. high, obtusely triquetrous. Leaves long, but usually shorter than the stem. Spikelets loosely spicate or almost racemose, occupying nearly the whole of the secondary rays and some of the primary ones of a slightly compound umbel, the longest rays 3 to 4in. long. Involucre bracts usually 2 or 3 much longer than the inflorescence, besides 1 or 2 short ones. Spikelets spreading, sessile or stipitate, of a rich brown, linear-lanceolate, 5 to 6 lines long, or in some Indian specimens twice that length, 1½ line broad, 12 to 20-flowered in *Brown's* specimens, 30 to 40-flowered in some Indian ones, the rhachis angled and notched but not winged. Glumes navicular but obscurely keeled, at first imbricate at length slightly spreading, obtuse or scarcely acute, of a uniform shining brown, but bordered by a white hyaline margin sometimes very narrow, sometimes broad at the apex. Style 8-cleft. Nut obovoid, triquetrous, about half the length of the glume.—*C. procerus*, *Vahl* according to *Kunth, Enum.* ii. 72, but not of *Rottboell*; *C. Heynei*, *Bœckel. in Linnæa*, xxxv. 600.

Hab.: Queensland, *F. v. M.*

The species closely resembles a digynous species of the sections *Pycnus*. *Rottboell's C. procerus* is probably a mere variety of *C. rotundus*.—*Benth.*

37. **C. Iria** (from *Ira*, *Rheede's* name in *Hort. Mal.* xii. 105, t. 56), *Linnæ. Kunth, Enum.* ii. 88; *Benth. Fl. Austr.* vii. 276. Stems tufted, 6in. to 1½ft. high or rarely more, triquetrous. Leaves flaccid, shorter than the stem or rarely one longer. Spikelets loosely and irregularly spicate along the rays of a simple or compound umbel, either occupying nearly the whole ray or almost crowded into a terminal cluster, the longer rays from 1 to 3in. Involucre bracts 3 or 4, of which 1 or 2 sometimes longer than the inflorescence. Spikelets linear-oblong, obtuse, flat, 2 to 5 lines long, 1 to 1½ line broad and 6 to 12-flowered in the common form, the rhachis not winged. Glumes loosely imbricate or at length distant, very obtuse, of a pale brown or yellowish-green, the keel prominently 3 or 5-nerved, the sides broad and nerveless. Stamens 2 or 3, the filaments often united in a prominent hypogynous ring at the base. Style 8-cleft. Nut obovoid, prominently 8-angled, about as long as the glume.—*Bœckel. in Linnæa*, xxxv. 595; *F. v. M. Fragm.* viii. 266.

Hab.: Port Denison, *Fitzalan*; Bowen Downs, *Birch*.

The species is abundant in tropical Asia, extending northwards to China and Japan, and westward to East tropical Africa.

88. *C. eleusinoides* (like an Eleusine), *Kunth, Enum. ii. 89*; *Benth. Fl. Austr. vii. 277*. Stems from a hard rhizome 2ft. high or more, acutely 3-angled. Leaves with long sheaths covering the lower part of the stem, the lamina sometimes short narrow and rigid, sometimes broad and as long as the stem. Spikelets in dense close spikes occupying the whole or nearly the whole of the partial rays of a compound umbel which is usually narrow and irregular, the longer primary rays often 6 to 8 in. long and very erect. Involucral bracts few, 1 or 2 much longer than the inflorescence. Spikelets linear, flat, regularly pinnate, pale coloured, 4 to 5 or rarely 6 lines long, rather above 1 line broad, with 10 to 16 or rarely more flowers, the rhachis not winged or with a very narrow border. Glumes spreading, loosely imbricate or rather distant, somewhat scarious and often notched at the top, the prominent keel produced into a short point, and 2, 3 or rarely 4 nerves on each side. Style 3-cleft. Nut obovoid or oblong, prominently 3-angled, more than half the length of the glume.—*Boeckel. in Linnæa xxxv. 596*; *C. xanthopus*, *Steud. in Flora, 1842, 596*; *F. v. M. Fragm. viii. 264* (partly).

Hab.: Port Denison, *Fitzalan*; Rockhampton and neighbourhood, *Dallachy, O'Shanesy*; Springsure, *Wuth*; Lockyer, *Hartmann*.

The species is widely spread over East India and tropical Africa.

89. *C. distans* (glumes distant), *Linn. f.*; *Kunth, Enum. ii. 98*; *Benth. Fl. Austr. vii. 277*. Stems 1 to 2ft. high, slender or rather stout, triquetrous. Spikelets at first in narrow dense spikes, expanding into loose simple or branched racemes, in a simple or compound umbel, the rays few or many, slender or sometimes filiform. Involucre of few narrow bracts, 1 or 2 longer than the inflorescence. Spikelets very narrow, linear, $\frac{1}{4}$ to 1 in. long, loosely spreading when fully out, 10 to 20-flowered, the rhachis filiform, not winged. Glumes distant, appressed to the rhachis or rarely spreading, narrow, obtuse, the keel prominent with 1 or 2 nerves on each side, the broad or narrow margins pale and nerveless. Style 3-cleft. Nut oblong, 3-angled, nearly or quite as long as the glume.—*Jacq. Ic. Rar. t. 299*; *Beauv. Fl. Ow. et Ben. t. 20*; *Boeckel. in Linnæa, xxxv. 612*; *F. v. M. Fragm. viii. 266*; *C. elatus*, *Rottb. Descr. et. Ic. Pl. t. 10*, not of *Linn.*

Hab.: Herbert's River, *Dallachy, Bowman*; Rockingham Bay, *Dallachy*; Rockhampton, *O'Shanesy*.

This species is very widely spread over the warmer regions of the New and the Old World.

40. *C. corymbosus* (corymbose), *Rottb. Descr. et Ic. 42, Trim. Ceyl. Fl. v. 29*. Perennial, the rootstock stout, creeping, root-fibres stout. Stem 2 to 3ft. high, thick as a goose-quill, spongy, appearing septate, lower portion terete, sub-8-angular above. Leaves none or a short blade rarely 6 in. long, terminating a long loose membranous sheath. Umbel compound, narrow, rays 6 to 8, erect or suberect, very unequal, longest 4 in., bearing secondary rays terminated by spikes or corymbs of 4 to 8 very slender spikelets. Bracts 3 very short, rarely as long as the umbel, keeled, green, margins recurved, bracteoles setaceous; spikelets very variable in length, $\frac{1}{4}$ to 1 in. long, linear, very slender, about $\frac{3}{4}$ line, subterete, pale red, rhachis narrowly winged. Glumes erect, rather distant but appressed, oblong, obtuse, rather membranous, dorsally rounded and 8-veined, margins pale, veinless. Stamens 8, anthers linear, mucous. Nut minute, trigonous. Style long as nut. Stigmas 8, long, capillary.—*C. diphyllus*, *Retz. according to Boeckeler, in Linnæa, xxxvi. 273*; *Benth. Fl. Austr. vii. 279*.

Hab.: Rockhampton, *O'Shanesy*; and further in the tropics.

The species extends over a great part of East India.

41. *C. rotundus* (round), *Linn.*; *Kunth, Enum. ii. 58*; *Benth. Fl. Austr. vii. 279*. Nut Grass. Rhizome creeping or stoloniferous, swelling here and there into tunicated tubers, the scales when worn away leaving annular scars or zones.

Stems rather slender, usually 1 to 1½ ft. high, but sometimes short, triquetrous towards the top. Leaves rather narrow, much shorter than the stem, the sheaths often long and loose. Spikelets usually 6 to 10 together in clusters or short spikes in an umbel of few rays, the outer ones sometimes slender and 2 or 3 in. long but more frequently the umbel rather dense and sometimes almost contracted into a compound cluster. Involucral bracts few, 1 or 2 longer than the inflorescence. Spikelets usually of a rich brown, linear, acute, compressed but not very flat, usually about 5 or 6 lines long and rather above 1 line broad, with 12 to 20 flowers, but varying to a much greater length, the rhachis slightly flexuose and bordered by rather broad hyaline wings either persistent or at length deciduous. Glumes imbricate, not very broad, obtuse or rather acute, more or less distinctly several-nerved, with a prominent keel usually green. Stamens 8. Style 3-cleft. Nut obovoid, 3-angled, less than half the length of the glume.—R. Br. Prod. 216; Sieb. Agrostoth. n. 112; F. v. M. Fragm. viii. 239; Bæckel, in Linnæa, xxxvi. 288; *C. hexastachyus*, Rottb. Descr. et Ic. Pl. 28, t. 14, f. 2; *C. littoralis*, R. Br. Prod. 216; Sieb. Agrostoth. n. 109; *C. tuberosus*, Rottb. Clarke in Fl. Brit. Ind. vi. 616.

Hab.: Brisbane River, Moreton Bay, Rockhampton and numerous other localities north and south.

A troublesome pest in farms and gardens.

Var. *carinatus*. Spikelets rather long, the keel of the glumes green, broad and very prominent, sometimes winged.—Rockingham Bay, *Dullachy*.

The species is abundantly spread over the tropical and temperate regions of the New and the Old World, varying in many places almost as much as in Australia and sometimes difficult to distinguish from *C. esculentus*.

42. *C. tenuiflorus* (flowers slender), Rottb. Root creeping; stem acutely triangular, smooth, leafy at the base. Leaves flat, shorter than the stem; floral leaves about 4, longer than the compound umbel of spikelets. Peduncles corymbosely placed, about 7, at the upper part spreadingly branched. Spikelets 2 to 8, almost panicle, narrow-linear, compressed, containing 16 to 24 flowers. Glumes ovate, blunt, navicular, with 7 to 9 nerves of chestnut color. Style very long; nut egg-shaped and somewhat triangular; rhachis membranous at the edges.—F. v. M. in letter.

Hab.: Near the Queensland border of New South Wales, F. v. M.

43. *C. lucidulus* (shining), Klein; in Link's Jahrb., iii. 86, not of C. B. Clarke. Stem tuberosus at the base, triangular, smooth. Leaves not much shorter than the stem, flat, rough at the margin; floral leaves 3 to 5, very long. Peduncles 6 to 13, umbel-like arranged. Spikelets 4 to 11, fasciculate-spicate, linear, compressed, 10 to 16-flowered. Bracts ovate, the upper ones short-pointed, navicular, 7 to 9-nerved, brownish-green with pale margin. Nut ovate-ellipsoid, triangular, pointed, brownish, dotted, somewhat shining, 3 to 4 times shorter than the bracts; wings of the rhachis receding.—F. v. M. in letter.

Hab.: Near the Queensland border of New South Wales, F. v. M.

I have followed F. v. M. in giving this specific rank, but C. B. Clarke in Fl. Brit. Ind. vi. 616 places it as syn. of *C. tuberosus*, of which he also makes the Australian *C. rotundus* and *C. tenuiflorus* synonyms.

44. *C. congestus* (crowded), Vahl; Kunth. Enum. ii. 87; Benth. Fl. Austr. vii. 280. Stems rather stout, 1 to 2 ft. high, acutely 3-angled in the upper part. Leaves shorter than the stem, with rather long sheaths, the lamina often 2 lines broad, with long points. Spikelets numerous, in very dense short spikes ¾ to 1 in. diameter, in an umbel of 3 to 6 or rarely more rays, the longest 3 to 4 in. long, or the whole inflorescence reduced to a dense sessile compound cluster. Involucral bracts several, of which 2 or 3 longer than the inflorescence and the outer one sometimes 2 to 3 lines broad; the bracts subtending the spikelets hyaline and persistent. Spikelets linear, spreading, brown, slightly flattened, 6 lines long or

rather more, and about 1 line broad when fully out, with 10 to 16 or rarely more flowers, the rhachis bordered by scarious wings often partially deciduous. Glumes loosely imbricate but scarcely spreading, obtuse or almost acute, keeled, with 8 or 4 nerves on each side. Stamens 8. Style 8-cleft. Nut broadly oblong, triquetrous, not quite half the length of the glume.—*F. v. M. Fragm.* viii. 269; *C. carinatus*, Nees in *Pl. Preiss.* ii. 72, not of R. Br.

Hab.: Queensland, *F. v. M.*

The species is chiefly South African.

45. ***C. subulatus*** (awl-shaped), *R. Br. Prod.* 217; *Benth. Fl. Austr.* vii. 281. Stems from a creeping rhizome rather slender, under 1ft. high in the specimens seen. Leaves very narrow, often as long as the stem. Spikelets in dense clusters or short spikes in an umbel of few rays. Involucral bracts very narrow, almost filiform, 1 or 2 of them longer than the inflorescence. Spikelets brown, linear, acute, not very flat, 6 to 8 lines long and scarcely 1 line broad, 12 to 20-flowered, the rhachis bordered by hyaline wings. Glume rather narrow, erect but not very closely imbricate, acute or scarcely obtuse, the keel green, 3-nerved, or sometimes 5-nerved, the sides brown and nerveless. Style 8-cleft. Nut rather broad, triquetrous, more than half the length of the glume.

Hab.: Queensland, *F. v. M.*

46. ***C. sporobolus*** (*Sporobolus*-like), *R. Br. Prod.* 215 *Benth. Fl. Austr.* vii. 281. Stems usually rigid but not very stout, obtusely triquetrous, from under 1 to 1½ft. high. Leaves much shorter. Spikelets in little globular heads or clusters in a compound umbel of 5 to 10 very unequal rays, the longer ones 1 to 3in. long, the clusters or heads at first 2 to 8 lines diameter but expanding to 4 or 5 lines. Involucral bracts few, of which 2 or 3 much longer than the inflorescence and sometimes very long. Spikelets spreading, flat, rarely above 2 lines long, with 5 to 8 flowers, the rhachis very short, but more or less distinctly bordered by hyaline wings. Glumes rather narrow, spreading, strongly several-nerved, the keel sometimes produced into a minute point. Style 8-cleft. Nut oblong, triquetrous, more than half as long as the glume.

Hab.: Island of the Gulf of Carpentaria, *R. Brown*; *Sweers Island*, *Henne*, with rather large spikelets and very spreading glumes.

C. sexflorus and *C. microcephalus*, *R. Br.* l.c. both from the same localities in the Gulf of Carpentaria, appear to me to be slight varieties of *C. sporobolus*, with smaller heads of spikelets and fewer flowers in each spikelet.—*Benth.*

47. ***C. angustatus*** (narrow), *R. Br. Prod.* 214; *Benth. Fl. Austr.* vii. 282. Stems rather slender, obtusely triquetrous, 1 to 3ft. high. Leaves narrow, mostly shorter than the stem. Spikelets 4 to 10 together in close clusters in a compound spreading umbel of 6 to 12 or even more slender rays, the longest often 3 or 4in. long. Involucral bracts narrow, 1 or 2 longer than the inflorescence and sometimes very long. Spikelets very spreading, linear, scarcely flattened, rather acute, brown or pale coloured, 4 to 8 lines long when fully out and scarcely above ½ line broad, with 10 to 20 flowers, the rhachis bordered by narrow hyaline wings. Glumes appressed or rarely slightly spreading, rather narrow, the keel produced into a small point, the sides striate with 2 or 3 prominent nerves. Style 8-cleft. Nut narrow-oblong, sometimes slightly clavate, triquetrous, nearly as long as the glume.—*Bœckel. in Linnaea*, xxxviii. 866.

Hab.: King's Creek, *Bourman*; *Gracemere*, *O'Shanessy*; *Bowen Downs*, *Birch*.

48. ***C. Novæ-Hollandiæ*** (New Holland), *Bœckel. in Linnaea*, xxxvi. 944; *Benth. Fl. Austr.* vii. 282. Rhizome thick and hard. Stems stout, acutely 8-angled in the upper part, 3 to 4ft. high. Leaves often longer than the stem, the sheath long, the lamina keeled below flat upwards and 2 to 3 lines broad.

Spikelets numerous, in dense clusters or heads in a rather large compound umbel of 10 to 12 or more rigid rays the longest 3 or 4 in. long, the partial umbels dense. Involucral bracts few, 1 or 2 often 1 to 2 ft. long, and 2 to 3 lines broad, with very scabrous edges, the bracts under the partial umbels small and scarious. Spikelets spreading, usually light brown, linear, not very flat, rather acute, 4 to 6 lines long, scarcely $\frac{1}{2}$ line broad, 10 to 20-flowered, the rhachis bordered by narrow hyaline wings. Glumes loosely imbricate but not spreading, rather narrow, obtuse or the keel produced into a very short point, the sides faintly nerved, brown with a pale margin. Style 3-cleft. Nut very narrow, triquetrous, as long as the glume or nearly so.

Hab.: Rockingham Bay, *Dallachy*; Rockhampton, *Thozet*.

49. **C. Gunnii** (after Ronald Campbell Gunn), *Hook. f. Fl. Tasm.* ii. 80, t. 140; *Benth. Fl. Austr.* vii. 283. Stems usually rigid but not very stout, obtusely triquetrous, from under 1 ft. to 2 or sometimes 3 ft. high. Leaves few, sometimes as long as the stem, much narrower than in *C. lucidus*. Spikelets from 8 or 10 to twice that number, in dense globular clusters or heads in a simple or compound umbel of 6 to 10 rays, the longest 1 to 2 or rarely 3 in. long. Involucral bracts few and narrow, 1 or 2 from 6 in. to above 1 ft. long. Spikelets lanceolate, acute, flat, of a rich brown, 2 to 4 lines long and above 1 line sometimes nearly 2 lines broad at the base, 8 to 12-flowered, the rhachis bordered by narrow hyaline wings. Glumes loosely imbricate or at length spreading, rather acute, keeled, with 2 or 3 prominent nerves on each side. Style 3-cleft. Nut narrow, prominently 3-angled, not much shorter than the glume.—*C. compositus*, Bœckel. in Linnæa, xxxvi. 333, not of R. Br.; *C. nodulosus*, F. v. M. in herb. plur.

Hab.: Towards Wallangarra.

50. **C. lucidus** (shining), *R. Br. Prod.* 218; *Benth. Fl. Austr.* vii. 283. Stems stout, from 1 to 3 or even 4 ft. high, prominently 3-angled. Leaves often longer than the stem and $\frac{1}{4}$ to $\frac{1}{2}$ in. broad. Spikelets in spikes occupying the whole or the upper part of the secondary rays of a large and compound umbel of many rays, the longer ones sometimes 8 or 9 in. long, the spikes sometimes rather loose and $1\frac{1}{2}$ to 2 in. long, sometimes shorter and dense, the rays of the inflorescence both general and partial often not closely umbellate, the common rhachis more or less produced. Involucral bracts 3, 4 or more, the outer ones often very broad and above 1 ft. long. Spikelets very spreading, of a rich brown, linear, flattened, acute, 4 to 6 or at length 7 or even 8 lines long, with 3 to 8 or rarely more flowers; the rhachis bordered by narrow hyaline wings. Glumes erect but not closely imbricate and sometimes at length distant, rather narrow, obtuse, the keel usually but not always pale coloured, the sides 2 or 3-nerved. Style 3-cleft. Nut oblong, prominently 3-angled, acuminate, rather shorter than the glume.—Bœckel. in Linnæa, xxxvi. 355; F. v. M. *Fragm.* viii. 270, partly; *C. sanguineofucus*, Nees in *Ann. Nat. Hist.* ser. I, vi. 46, as to the Tasmanian plant; *Hook. f. Fl. Tasm.* ii. 80, t. 139.

Hab.: Moreton Bay, *F. v. Mueller*, *Leichhardt* and others; Boyne River, *Hartmann*.

51. **C. pennatus** (winged), *Lam.*; *Kunth. Enum.* ii. 80, but not of Bœckeler. *Benth. Fl. Austr.* vii. 284. Stems $1\frac{1}{2}$ to $2\frac{1}{2}$ ft. high, obscurely triquetrous or almost terete. Leaves complicate at the base with rather long sheaths, ending in long slender points often exceeding the stem. Spikelets in dense spikes of $\frac{1}{2}$ to 1 in. in a compound umbel of many rays, the outer ones often 3 to 6 in. long. Involucral bracts 3 to 6, rather rigid, very scabrous on the edges, the outer ones often $1\frac{1}{2}$ ft. long. Spikelets very spreading, oblong-lanceolate, thick but more or less flattened, 3 to 5 lines long, $1\frac{1}{2}$ to 2 lines broad, pale-coloured, 4 to 8-flowered, the rhachis bordered by broad hyaline wings. Glumes closely imbricate, broad,

rather acute, concave, slightly keeled only above the middle, very obscurely nerved. Style 3-cleft. Nut obovoid, prominently 3-angled, nearly half the length of the glume.—F. v. M. Fragm. viii. 268; *C. canescens*, Vahl; Bœckel. in Linnæa, xxxvi. 840; *C. ventricosus*, R. Br. Prod. 217.

Hab.: Broadsound, *R. Brown*; Port Molle, *M'Gillivray*; Cape York, *Daemel*; Rockhampton, *Thozet*, *O'Shanesy* (with rather long spikelets); Broadwater, *Eaves*.

52. *C. exaltatus* (tall), *Retz.*; *Kunth. Enum.* ii. 70; *Benth. Fl. Austr.* vii. 285. Stem stout, 1 to 8ft. high. Leaves often longer, rather broad, but tapering into a long narrow point. Spikelets numerous, in loose spikes of 1 to 2in. in a large usually compound umbel of many rays, the longer ones often 3 or 4in. long. Involucral of few bracts, 1 or 2 much longer than the inflorescence. Spikelets linear, flat, of a shining brown or rarely pale and greenish, usually 2 to 4 lines long and scarcely 1 line broad, with 10 to 20-flowers, the rhachis bordered by hyaline wings often deciduous, the spikelets sometimes lengthening to $\frac{1}{2}$ in. with about 30 flowers and then when old appearing stipitate, the nuts with the glumes and wings of the rhachis having fallen away. Glumes closely imbricate, broad, the keel prominent and produced into a very short point with 2 or 3 obscure nerves on each side, the nerveless margins broad and rounded. Style 3-cleft. Nut prominently 3-angled, less than half the length of the glume.—Bœckel. in Linnæa, xxxvi. 319; F. v. M. Fragm. viii. 268; *C. venustus*, R. Br. Prod. 217.

Hab.: Keppel Bay, *R. Brown*; Port Denison, *Fitzalan* (with long narrow spikelets); Rockingham Bay, *Dallachy*; Rockhampton and numerous localities in the south.

The species extends over East India and the Malayan Archipelago.

53. *C. digitatus* (finger-like), *Roeb. Fl. Ind.* i. 205. Rhizome short and thick. Stems stout, triquetrous, 1 to 3ft. high, the angles acute and sometimes almost winged under the inflorescence. Leaves rather broad, often as long as or longer than the stem, with long broad sheaths and ending in long narrow points. Spikelets in elongated spikes in a compound umbel of many rays, the longer ones often 3in. long. Involucral bracts several, 2 of them much longer than the inflorescence. Spikelets spreading, linear-terete or scarcely flattened, pale-coloured, usually 3 to 6 lines long but sometimes twice as long, $\frac{1}{2}$ to $\frac{3}{4}$ line broad, 12 to 20-flowered, the rhachis bordered by hyaline wings. Glumes imbricate, narrow, shortly pointed, the keel prominent and obscurely 3-nerved, the nerveless sides pale brown or almost hyaline. Style 3-cleft. Nut oblong, obtuse, triquetrous, much shorter than the glume.—F. v. M. Fragm. viii. 268; *C. venustus*, *Kunth, Enum.* ii. 68, Bœckel. in Linnæa, xxxvi. 316, not of R. Br.; *C. auricomus*, *Benth. Fl. Austr.* vii. 286.

Hab.: Rockingham Bay, *Dallachy*; Port Curtis, *M'Gillivray*; King's Creek, *Bowman*.

Abundant in tropical Asia, extending to the South Pacific Islands and into tropical Africa.

54. *C. ferax* (fertile), *Rich.*; *Kunth, Enum.* ii. 89; *Benth. Fl. Austr.* vii. 286. Stems usually stout, 1 to 8ft. high, acutely or obtusely 3-angled. Leaves shorter or rarely as long as the stem. Spikelets numerous, in elongated spikes in a large compound umbel of numerous rays, the longest often 6 to 8in. long. Involucral bracts several, long and sometimes broad. Spikelets linear-terete, very spreading, 5 to 10 lines long, mostly 6 to 10-flowered, the rhachis flexuose, bordered by hyaline wings and at length articulate below the lowest flowering glume and sometimes between each glume. Glumes distant, but closely appressed to the rhachis, narrow, obtuse or almost acute, concave, scarcely keeled, 7 or 9-nerved. Style 3-cleft. Nut obovoid-oblong, obtusely triquetrous, half as long as the glume and closely embraced within it by the wings of the rhachis.—Bœckel. in Linnæa, xxxvi. 399; *C. pennatus*, Bœckel. l.c. 404, not of Lam.

Hab.: Port Curtis, *M'Gillivray*; Mount Elliott and Daintree River, *Fitzalan*; Gracemere, *O'Shanesy*.

Widely spread over the tropical regions of the New and the Old World.

55. *C. esculentus* (edible), *Linn. Sp. Pl.* 67. "*Mangara*". *Boulia*. "*Makora*". *Gloucester, Roth.* Root creeping, branched, bearing tubers. Stem triangular, smooth, leafy only at the base. Leaves as long as the stem or longer, somewhat channelled, rough particularly towards the summit and along the keel; floral leaves 4 to 6, longer than the ample or compound umbel. Peduncles 7 to 10, the longer of these spreadingly branched towards the upper end. Spikelets yellow or yellowish-brown, 11 to 14, disposed in spikes, lanceolate or linear, compressed; each with 10 to 18 flowers. Bracts ovate-elliptical, keeled, blunt or hardly pointed, 7 to 9-nerved, yellowish-brown, green towards the keel. Nut elliptical, triangular, somewhat apiculated, grey-brown, about half as long as the bract; rhachis membranous at the edges.

Hab.: Near the Queensland border of New South Wales, *F. v. M.*

The nut grass often met with on down country, not so troublesome as *C. rotundus*.

Tubers eaten raw or roasted.—*Roth.*

56. *C. Bowmanii* (after E. Bowman), *F. v. M.*; *Benth. Fl. Austr.* vii. 287. Stems tufted, very slender, 1 to 1½ ft. high. Leaves much shorter, very narrow. Spikelets in short close spikes in an umbel of few slender rays, the longest about 2 in. long, the whole inflorescence sometimes reduced to the central sessile spike. Involucral bracts few, very narrow, 1 or 2 rather longer than the inflorescence. Spikelets rather numerous, linear-terete, almost subulate, flexuose, 6 to 9 lines long and ending in a fine point, 6 to 10-flowered, the rhachis bordered by hyaline wings. Glumes distant, closely appressed to the rhachis, obtuse or scarcely acute, with a green rather broad keel, the sides brown and finely several-nerved. Style 3-cleft. Nut narrow, triquetrous, more than half as long as the glume, closely embraced within it by the wings of the rhachis.

Hab.: Brisbane River, Moreton Bay, *Bailey, Leichhardt* (the latter with rather broader leaves); *Herbert's Creek, Bowman; Gracemere, O'Shanesy.*

57. *C. trichostachys* (spike-hairy), *Benth. Fl. Austr.* vii. 287. Stems stout, about 2 ft. high, prominently 3-angled but quite smooth. Leaves mostly longer and rather broad. Spikelets in loose spikes of ½ to ¾ in. in a large umbel of numerous rays, the longer ones often 4 to 5 in. long. Involucre of several long bracts, the outer ones often 3 lines broad. Spikelets linear-filiform, spreading, 2 to 3 or rarely 4 lines long, usually 3 or 4-flowered, the rhachis flexuose and bordered by hyaline wings. Glumes distant, closely appressed to the rhachis, very narrow, acute. Style 3-cleft. Nut much shorter than the glume, very narrow, closely embraced by the wings of the rhachis.

Hab.: Rockingham Bay, *Dallachy.*

58. *C. lelocaulon* (stem smooth), *Benth. Fl. Austr.* vii. 287. Stems rather slender, usually about 1 ft. high, obtusely triquetrous, quite smooth. Leaves much shorter, narrow. Spikelets in ovoid-globular rather dense spikes or rather looser and nearly ½ in. long, in a simple umbel of about 4 to 6 rays, the longest 1 to 2 in. long. Involucre of few bracts not much longer than the inflorescence. Spikelets linear-terete, at length flexuose and 3 or sometimes 4 lines long, with about 3 flowers, the rhachis bordered by hyaline wings. Flowering-glumes narrow, distant, closely appressed to the rhachis, striate with several nerves, the terminal one often empty or with an imperfect flower. Style 3-cleft. Nut narrow, closely embraced by the wings of the rhachis. The spikelet falling away usually carrying off the second empty glume.—*Mariscus lavis*, *R. Br. Prod.* 218.

Hab.: Cape York, *Daemel*; Rockhampton, *O'Shanesy.*

Very nearly allied to the following and possibly a variety only. Some specimens from Endeavour River, *Banks and Solander*, appear almost intermediate between the two.—*Benth.*

59. **C. scaber** (rough), *Benth. Fl. Austr.* vii. 288. Stems 1 to 2ft. high or rather more, triquetrous and usually very scabrous on the angles. Leaves usually shorter but sometimes longer than the stem. Spikelets in ovoid or shortly cylindrical spikes, in a compound umbel with numerous rays, the longest 2 to 6in. long, the branches or partial rays divaricate. Involucral bracts several, often very long, the outer ones 2 to 3 lines broad. Spikelets slender, terete and often curved, either 1-flowered and about 2 lines long or flexuose with a second flower or empty glume at the end of the lower one, the rachis within the glume bordered by hyaline wings, two outer empty glumes much narrower than in *C. umbellatus*, flowering glume or glumes narrow, striate, closely appressed to the rachis. Style 3-cleft. Nut narrow, triquetrous, closely embraced by the wings of the rachis.—*Mariscus scaber*, R. Br. Prod. 218.

Hab.: Gulf of Carpentaria, R. Brown; Rockingham Bay, Dallachy; Percy Island, Walter.

This and the preceding species, although formerly placed in *Mariscus*, have all the characters of *Diclidium*, with the second and third flowering glumes always distant, not overlapped by the lower one as in the section *Mariscus*.—*Benth.*

60. **C. decompositus** (decompound), *L. r. M. Fragm.* viii. 267; *Benth. Fl. Austr.* vii. 288. Stems prominently 8-angled, several ft. high. Leaves very long, 8 to 4 lines broad. Spikelets in very numerous small globular clusters in a very compound umbel with numerous rays, the longest 4 to 6in. long. Bracts of the general involucre like the leaves, often 2ft. long or more and 3 to 4 lines broad with scabrous edges, those of the secondary and tertiary umbels small and setaceous. Spikelets not above $1\frac{1}{2}$ line long, narrow-ovoid, usually with 2 perfect flowers, the short rachis bordered by broad hyaline wings. Glumes usually 5, imbricate, broad and striate, the two lower and the terminal one empty. Style 3-cleft. Nut ovoid, triquetrous, more than half the length of the glume.—*Mariscus decompositus*, R. Br. Prod. 218.

Hab.: Gulf of Carpentaria, R. Brown; Endeavour River, Banks and Solander, A. Cunningham; Rockingham Bay, Dallachy.

61. **C. Armstrongii** (after —. Armstrong), *Benth. Fl. Austr.* vii. 289. Stems from a thick tufted base varying from under 1ft. to near 2ft. high, stout and triquetrous. Leaves rather broad and sometimes very long. Spikelets in cylindrical spikes in a more or less compound umbel of numerous but not long rays. Involucral bracts long, rather rigid, sometimes 2 to 3 lines broad. Spikelets very numerous but not closely packed, spreading, narrow oblong, scarcely more than 1 line long, mostly with 1 perfect flower. Glumes imbricate, 4 or 5, the lowest small empty and persistent, the second empty but half as long as the flowering one and falling off with it, the third or flowering glume rather acute, finely striate, enclosing the short winged rachis, the fourth glume shortly protruding, usually enclosing a male flower and sometimes a second male flower and glume above it. Style 3-cleft. Nut ovoid-oblong, triquetrous, nearly as long as the glume.

Hab.: Percy Islands, A. Cunningham; Rockingham Bay, Dallachy.

62. **C. umbellatus** (flowers in umbels), *Benth. Fl. Hongk.* 366, and *Fl. Austr.* vii. 289. Stems from under 1ft. to nearly 2ft. high, triquetrous, smooth. Leaves variable, narrow or rather broad, shorter or longer than the stem. Spikelets very numerous, in close cylindrical spikes of $\frac{1}{2}$ to 1in. all sessile or mostly pedunculate in a simple umbel or very rarely 1 or 2 of them branched at the base. Involucral bracts usually several, much longer than the inflorescence, the outer ones sometimes 2 or 3 lines broad. Spikelets spreading, linear-terete, $1\frac{1}{2}$ to 2 lines long, almost always 1-flowered. Two outer glumes short and empty, both usually attached below the articulation; flowering glume occupying the whole spikelet, enclosing the flower and a continuation of the rachis which with its wings assumes the appearance of an empty scarious glume. Style

3-cleft. Nut narrow, triquetrous, nearly as long as the glume and enclosed in it.—F. v. M. Fragm. viii. 267; *Mariscus umbellatus*, Vahl; Kunth, Enum. ii. 118; *Kyllinga umbellata*, Rottb. Descr. et Ic. Pl. 15, t. 4, f. 2; Beauv. Fl. Ow. et Ben. t. 55; *Kyllinga panicea*, Rottb. l.c. t. 4, f. 1.

Hab.: Condamine River, *Leichhardt*, and various localities in South Queensland, *Bowman* and others; Brisbane River, F. v. *Mueller*, *Bailey*.

Var. *laxiflora*. Spikes longer and not so dense, 1 or 2 of the outer ones with a short branch at the base.—Herbert Creek, *Bowman*.

The species is widely distributed over tropical Asia and Africa.

63. **C. conicus** (conical), *Böckel.* in *Linnaea*, xxxviii. 871; *Benth. Fl. Austr.* vii. 290. Stems 1 to 1½ ft. high, rather rigid, often much thickened at the base. Leaves often as long, rather rigid, ending in long subulate points, the margins scabrous and sometimes almost spinulose-denticulate. Spikelets very numerous, usually in dense sessile ovoid or conical heads, often 8-lobed at the base, 4 to 6 lines long and often as broad, in a simple umbel of 6 to 10 rays, the longest 1½ to 2 in. long. Involucral bracts 3 to 5, long and tapering into long subulate points. Spikelets narrow-oblong, nearly 1½ lines long, with 1 perfect flower. Glumes imbricate, the lowest empty glume small, very broad and cup-shaped, scarious, remaining usually with the subtending small glume-like bract persistent after the spikelet has fallen off, the second empty glume ovate obtuse striate more than half the length of the spikelet; flowering glume almost acute, striate, closely enveloping the broadly winged rhachis and the base of a fourth glume which is empty or contains a male flower. Style 3-cleft. Nut ovoid, triquetrous, nearly as long as the glume.—F. v. M. Fragm. viii. 268; *Mariscus conicus*, R. Br. Prod. 218.

Hab.: Gulf of Carpentaria, R. *Brown*, Port Curtis, M'Gillivray; Bokhara Creek, *Leichhardt*; Bowen Downs, *Birch*.

Var. *ramosus*. Heads of spikelets branching into dense pyramidal panicles. Leaves numerous, broad at the base.—*Sweers Island*, *Henne*; Port Denison, *Fitzalan*.

2. KYLLINGA, Rottb.

(After P. Kylling).

Spikelets with a single apparently terminal hermaphrodite flower or with a second smaller usually male or imperfect flower immediately above it. Glumes 3 or 4, distichous, concave, or navicular and keeled, of which the upper 2 closely enclosing the flower and fruit and at length falling off with it, the short stipes or rhachis of the spikelets being articulate at or above the base, the lowest glume small and empty. No hypogynous scales or bristles. Stamens 3 or fewer. Style continuous with the ovary, not thickened at the base, usually deciduous; stigmatic branches 2, filiform. Nut sessile, flat, without any hypogynous disk.—Perennials or rarely annuals with simple stems leafy at the base only. Spikelets small, very numerous, densely crowded in 1, 3 or rarely more terminal globular or oblong-cylindrical heads, sessile within an involucre of 2 to 4 unequal linear leafy bracts. When the second flower is present it is always enclosed in or subtended by a small hyaline additional glume, and, if perfect, both the nuts are enclosed in the 2 larger glumes.

The genus is widely spread over the warmer regions of the New and the Old World and the Australian species are none of them endemic, all four appear to be Asiatic and two at least also African and American, but the characters upon which *Böckeler* and others have distinguished a large number of species are often very vague or trifling, and require further scrutiny before the extent of the geographical range of the principal forms can be determined. F. v. *Mueller* proposes to unite the genus with *Cyperus*, to which it is certainly nearly allied, but the peculiar structure of the spikelet is quite constant in all the species I have examined.

Heads of spikelets solitary and globular, or very rarely with 2 short lateral ones.

Second male flower usually present. Nuts ovate, pale, nearly as long as the glumes. Larger glumes very unequal 1. *K. intermedia*.

No second flower. Nut ovate, pale, much shorter than the glume.

Larger glumes nearly equal, acutely keeled.

Central head of spikelets oblong-cylindrical, with or without 2 or more shorter lateral ones. No second flower. Larger glume scarcely keeled.

Nut large, broad, usually very dark. Head of spikelets usually single.

Nut narrow, pale. Heads of spikelets 3 to 5.

2. *K. monocephala*.

3. *K. cylindrica*.

4. *K. triceps*.

1. *K. intermedia* (intermediate), *R. Br. Prod.* 219; *Benth Fl. Austr.* vii. 251. Stems from a creeping rhizome, slender, 6 in. to above 1 ft. high. Leaves grass-like, about 1 line broad, much shorter than the stem. Involucre of about 8 very unequal narrow bracts. Flower-head single, globular, about 8 lines diameter, the spikelets rather more acuminate and spreading than in *K. monocephala*, about $1\frac{1}{2}$ line long. The two larger glumes several-nerved without any very prominent keel, the innermost considerably larger than the other, and enclosing usually a second male-flower in a small hyaline glume, the lowest empty glumes usually close under the larger ones and falling off with them. Nut ovate, pale-coloured, nearly as long as the glumes.—*K. brevifolia*, *Rotb.*; *Clarke in Hook. Fl. Brit. Ind.* vi. 589.

Hab.: Rockhampton, *O'Shanesy*; Moreton Bay or neighbourhood, *Leichhardt*. A common weed in southern localities.

This species apparently the commonest in Australia is also in New Caledonia and in East India.

2. *K. monocephala* (head single), *Rotb. Ic. et Descr. Pl.* 13, t. 4, f. 4; *Benth. Fl. Austr.* vii. 251. Stems tufted but often decumbent or stoloniferous at the base or from a long creeping rhizome, rarely above 1 ft. high and often only 6 in. Leaves shorter than the stem and very narrow in the typical form. Involucral bracts long and narrow. Flower-head or spike globular or ovoid, about 8 lines diameter or sometimes lengthening to 4 lines, solitary or very rarely with a small one on each side. Spikelets 1-flowered, the larger glumes nearly equal or the inner one rather longer especially when in fruit, many-nerved with a prominent usually ciliate keel. Nut broadly ovate or obovate, pale-coloured, much shorter than the glume.—*R. Br. Prod.* 219; *Kunth, Enum.* ii. 129; *Boeckl. in Linnæa*, xxxv. 427; *K. pumila*, *Mich.*; *Kunth, Enum.* ii. 182, at least as to the Australian plant; *Cyperus monocephalus*, *F. v. M. Fragm.* viii. 271.

Hab.: Rockingham Bay, *Dallachy*; Rockhampton, *O'Shanesy*. A common weed in southern localities.

Var. *latifolia*. Leaves and involucral bracts $1\frac{1}{2}$ to 2 lines broad.—Moreton Bay, *Leichhardt*; Johnstone River, *Dallachy*; Rockhampton, *Thozet*.

The species is common in tropical Asia and Africa.

3. *K. cylindrica* (cylindric), *Nees*; *Kunth, Enum.* ii. 188; *Benth. Fl. Austr.* vii. 252. Rhizome tufted or shortly creeping. Stems from 6 in. to above 1 ft. high, the leaves much shorter. Involucral bracts rather long, spreading or reflexed. Flower-heads nearly white, or spikes oblong-cylindrical, 5 to 6 lines long when fully out, solitary or with a small globular head on each side. Spikelets 1-flowered, the larger glumes broader than in the other species, rather above 1 line long, nearly equal, the keel not very prominent, with 3 or 4 nerves on each side, the articulation usually immediately below the larger glumes leaving the lower smaller one more persistent on the base of the stipes or rhachis or falling off separately. Nut broad, black, nearly as long as the glumes.—*Boeckl. in Linnæa*, xxxv. 415.

Hab.: Brisbane River, Moreton Bay, *F. v. Mueller, Bailey*. Very common on sandy land inland.

The plant scarcely differs from the East Indian one.

4. *K. triceps* (3-headed), *Rotb. Ic. et Descr. Pl.* 14, t. 4, f. 6; *Benth. Fl. Austr.* vii. 252. Stems tufted; not creeping, but the rhizome at length rather thick and shortly horizontal, from 6 in. to about 1 ft. high. Leaves much shorter

and narrow. Involucral bracts long and narrow. ~~Spikes or flower-heads~~ usually 3, the central one ovoid-oblong, about 4 lines long, the lateral ones shorter and globular and occasionally a fourth or a fifth globular flower-head in the same cluster. Spikelets 1-flowered, scarcely 1 line long, narrow, the upper glumes nearly equal, 5 or 7-nerved, the keel not much more prominent than the lateral nerves. Nut narrow-oblong, pale-coloured, shorter than the glumes.—Kunth, Enum. ii. 133; Bœckel. in *Linnaea*, xxxv, 413.

Hab.: Cape River, *Bowman*; Rockhampton, *O'Shanesy*; Mackay, *Nernst*.

The species is widely spread over tropical Asia and Africa.

3. HELEOCHARIS (Eleocharis), R. Br.

(Said to be so named from the plants delighting in marshes.)

(*Scirpidium* and *Heleogenus* (*Eleogenus*) *Nees*.)

Spikelet solitary, terminal, with many hermaphrodite flowers. Glumes imbricate all round the rhachis, the lowest 1 or 2 empty. Hypogynous bristles about 3 to 8, usually scabrous or ciliate with reflexed hairs, rarely deficient. Stamens 3, 2 or 1. Style dilated at the base, divided to above or below the middle into 2 or 3 filiform stigmatic branches. Nut obovoid or nearly globular and 3-ribbed, or more or less flattened and biconvex with 2 marginal ribs, always crowned by the conical or depressed persistent base of the style, the remainder of the style falling away.—Stems simple, tufted, without perfect leaves, the barren stems often taken for leaves, the real leaves reduced to sheathing scales, of which the lowest are short brown and loose, the innermost (sometimes the only one) forming a long sheath closely appressed nearly or quite to its orifice. No involucre except the outer empty glume, which takes the place of a bract subtending the spikelet and is sometimes larger than the other glumes, very rarely produced into a short point.

Generally distributed over the tropical and temperate regions of the New as well as the Old World, two species extending to within the Arctic circle.

SECT. I. *Limnocharis*.—Spikelets cylindrical. Glumes obtuse, not at all or very obscurely keeled, rather rigid, with a hyaline border. Persistent base of the style forming a conical usually flat beak to the nut.

Stems terete, appearing articulate from the transverse septa dividing the internal pith.

Stems continuous, obtusely triquetrous or terete.

Glumes almost white, scarcely striate, the hyaline border very narrow and soon disappearing, the spiral arrangement very prominent.

Glumes pale or dark, distinctly striate, the spiral arrangement not prominent.

Stems continuous, acutely 3 or 4-angled.

1. *H. sphacelata*.

2. *H. spiralis*.

3. *H. variegata*.

4. *H. fistulosa*.

SECT. II. *Scirpidium*.—Spikelet cylindrical or tapering upwards. Glumes with a distinct green centre or prominent keel. Persistent base of the style shortly conical.

Stem slender, acutely 4-angled.

Stem obtusely angled, or terete and striate.

Inner leaf-sheath truncate at the orifice with a small erect point.

Nut biconvex.

Spikelet pale-coloured, obtuse.

Spikelet usually dark-coloured and rather acute.

Inner leaf-sheath oblique at the orifice without the dorsal point.

Spikelet 6 to 8 lines long. No hypogynous bristles. Nut biconvex.

5. *H. tetraquetra*.

6. *H. cylindrostachys*.

7. *H. acuta*.

8. *H. atricha*.

SECT. III. *Heleogenus*.—Spike ovoid-conical or small and few-flowered. Glumes keeled. Persistent base of the style short and depressed. Leaf-sheath oblique at the orifice, often scarious.

Nut biconvex, very smooth. Glumes deciduous, usually numerous.

Spike dense, many-flowered, pale coloured. Stems mostly above 6 in.

high. Glumes broad, with a green centre.

Spike loose, dark-coloured, the glumes not very numerous, prominently

keeled. Stems under 3 in.

9. *H. capitata*.

10. *H. atropurpurea*.

1. **H. (H.) sphacelata** (withered), *R. Br. Prod.* 224; *Benth. Fl. Austr.* vii. 292. "Ma-bil," Cooktown, "Ari-ira," Musgrave River, "Panje-a," Batavia River; "Bulkuru," Tully River, *Roth*; "Kaya," Rockhampton, *Thozet*. Rhizome creeping or stoloniferous. Stems from under 2ft. to 4 or 5ft. high, 2 to 5 lines diameter, terete but appearing articulate from internal transverse septa, the principal nodes $\frac{1}{2}$ to 1in. distant, but several minor ones often appearing between them. Spikelet cylindrical, 1 to 2 $\frac{1}{2}$ in. long; 2 to 4 lines diameter. Glumes closely imbricate, broadly obovate, very obtuse, scarcely striate but sometimes faintly 1-nerved, bordered by a narrow scarious margin and immediately under it by a brown zone or dark line. Hypogynous bristles 6 to 9, usually longer than the nut. Style branches 2 or 3. Nut rather broad, minutely pitted or granular but not distinctly striate, the flattened beak rather narrow, with a narrow ring round its base.—*Kunth, Enum.* ii. 154; *Bœckel. in Linnæa*, xxxvi. 475; *Hook. f. Fl. Tasm.* ii. 85; *F. v. M. Fragm.* viii. 239; *Scirpus sphacelatus*, *Spreng. Syst.* i. 204; *Heleocharis plantaginica*, *F. v. M. Fragm.* viii. 238, not of *R. Br.*

Hab.: Gulf of Carpentaria, *R. Brown*; Rockhampton (the tubers of the rhizome alimentary) *O'Shanesy*; Brisbane River, *Bailey*.

Tubers eaten raw; or baked first and then roasted; stems used for making dilly-bags and mats.—*Roth*.

2. **H. (H.) spiralis** (spiral), *R. Br.*; *Kunth, Enum.* ii. 155; *Benth. Fl. Austr.* vii. 292. Stems almost terete or more or less triquetrous, continuous inside, 1 $\frac{1}{2}$ to 3ft. high. Spikelets cylindrical, $\frac{1}{2}$ to 1in. long, about 2 lines diameter, pale-coloured or almost white. Glumes broadly ovate, closely imbricate, with a spiral arrangement more evident than in any other species, very faintly striate, very obtuse, with a narrow scarious margin which at length disappears. Hypogynous bristles about 6, glabrous or scarcely appearing scarious under a strong lens. Styles branches 2 or 3. Nut obovate, compressed biconvex, the beak or persistent base of the style shortly conical.—*Bœckel. in Linnæa*, xxxvi. 473; *Scirpus spiralis*, *Rottb. Decr. et Ic. Pl.* 45, t. 15 f. 1.

Hab.: Tarampa Creek.

The species is dispersed over the tropical regions of both the New and the Old World, but chiefly in tropical America.

3. **H. (H.) variegata** (variegated), *Kunth, Enum.* ii. 153; *Benth. Fl. Austr.* vii. 293. Stems obtusely triquetrous or nearly terete, continuous inside, from under 1ft. to nearly 2ft. high, usually 1 to 2 lines but when luxuriant 3 lines diameter. Sheathing scale oblique and appressed at the orifice. Spikelets cylindrical, from $\frac{1}{2}$ in. long when in flower to nearly 1in. when in fruit, 1 $\frac{1}{2}$ to 2 $\frac{1}{2}$ lines diameter. Glumes from very broadly ovate to obovate-oblong, very obtuse, not keeled, many-nerved, with a narrow scarious border, either wholly pale coloured or with a dark line within the border. Hypogynous bristles usually about 6, very unequal in length. Style-branches 2 or 3. Nut biconvex, broad, striate and slightly transversely rugose, the beak or persistent base of the style narrow-conical, flattened, with a broad annular base.—*Bœckel. in Linnæa*, xxxvi. 470; *Scirpus variegatus*, *Poir. Dict.* vi. 749; *H. (F.) Sieberi*, *Kunth, l.c. H. (F.) compacta*, *R. Br. Prod.* 224; *F. v. M. Fragm.* viii. 239; *Scirpus compactus*, *Spreng. Syst.* i. 202.

Hab.: Rockingham Bay, *Dallachy*, Narrau River, *Mitchell*.

The species is subtropical spread in tropical and subtropical regions in the Old World and is also in tropical America.

4. **H. (H.) fistulosa** (pipy), *Schultz.*; *Kunth, Enum.* ii. 155; *Benth. Fl. Austr.* vii. 293. Stems continuous inside, acutely and equally 8-angled or unequally 4-angled, 1 to 2ft. high, 1 $\frac{1}{2}$ to 2 lines diameter. Spikelets cylindrical, often fully 1in. long, 1 $\frac{1}{2}$ to 2 lines diameter. Glumes imbricate but not very

dense, ovate, obtuse but often narrower than in *H. variegata*, obscurely keeled, striate, bordered by a narrow scarious margin sometimes almost obsolete. Hypogynous bristles about 6. Style-branches 2 or 3. Nut broad, biconvex, striate and pitted between the striæ, the beak or base of the style flat-conical, short, with a raised annular base.—Bœckel. in Linnæa, xxxvi. 472; F. v. M. Fragm. viii. 239.

Hab.: Rockhampton, Bowman, O'Shanesy.

Widely spread over the tropical regions both of the New and the Old World.

5. *H. (E.) tetraquetra* (4-angled), Nees; Kunth, Enum. ii. 150; Benth. Fl. Austr. vii. 294. Stems slender, acutely 4-angled, usually about 1 ft. high. Inner sheathing scale appressed and truncate at the orifice with a minute erect point on one side as in *H. acuta*. Spikelet oblong-lanceolate, 3 to 4 lines long, 1 to 1½ line diameter. Glumes rather more obtuse than in *H. acuta*, with a green centre, brown sides, and narrow scarious margins. Hypogynous bristles about 6, as long as the nut. Style branches 3. Nut obovoid, 3-ribbed, smooth, the conical beak or base of the style somewhat flattened.—Bœckel. in Linnæa, xxxvi. 447; F. v. M. Fragm. viii. 239.

Hab.: Sunnybank, Field Naturalists.

Also in the East Indies.

6. *H. cylindrostachys* (spike cylindric), Bæckel. in Flora, 1875, 108; Benth. Fl. Austr. vii. 294. Stems terete, rather stout, mostly above 1 ft. high when full grown. Inner sheathing scale closely appressed, truncate at the orifice with an erect point of $\frac{1}{2}$ to $1\frac{1}{2}$ line as in *H. acuta*. Spikelet oblong-cylindrical, obtuse, 6 to 9 lines long when fully out, scarcely 2 lines diameter, very pale coloured. Glumes very numerous and closely imbricate, ovate-oblong, very obtuse, scarious with thin hyaline margins, the green central nerve more or less distinct, otherwise nerveless, scarcely coloured or faintly tinged with brown, very deciduous as in *H. capitata*. Hypogynous bristles 6 to 8, mostly longer than the nut. Style branches 8 or rarely 2. Nut broadly obovate, usually much flattened, the beak or base of the style broadly conical and flat.

Hab.: Wide and Moreton Bays, Leichhardt; Rockhampton, Thozet; Boyne River, Hartmann; Castle Creek, Bunce; Stanthorpe and many other southern localities.

7. *H. (E.) acuta* (acute), R. Br. Prod. 224; Benth. Fl. Austr. vii. 294. Rhizome creeping. Stems rather slender, terete, from 6 or 8 in. to 1½ ft. high or rather more. Sheathing scale appressed and horizontally truncate at the orifice, the edge often dark coloured, with a small erect point or rudimentary lamina $\frac{1}{2}$ to 1 line long, inserted usually on one side, immediately below the margin. Spikelet linear-oblong or lanceolate, rather acute, from under $\frac{1}{2}$ in. to nearly 1 in. long. Glumes obtuse or almost acute, the dorsal nerve or keel more or less prominent, the sides brown with pale more or less scarious margins. Hypogynous bristles 8 to 7, usually 5 or 6, longer or shorter than the nut. Style branches usually 8. Nut obovoid or almost orbicular, very convex on both sides.—*H. (E.) mucronulata*, Nees. in Ann. Hist. ser. i. vi. 46; Bœckel. in Linnæa, xxxvi. 466; *H. (E.) gracilis*, Hook. f. Fl. Tasm. ii. 85, not of R. Br.; *H. palustris*, F. v. M. Fragm. viii. 240, not of R. Br.; *Scirpus acutus* and *S. tener*, Spreng. Syst. i., 208, 201.

Hab.: Endeavour River, Banks and Solander; Plains of the Condamine, Leichhardt, Gracemere, O'Shanesy; Stanthorpe.

Var. *pallens*. Spikelet of a very pale brown, the glumes almost scarious, but the shape of the spikelet, the number and shape of the glumes and other characters, those of *H. acuta* not of *H. cylindrostachys*.—Bowen Downs, Birch; and probably Rockhampton, Amalia Dietrich.

The typical form of *H. acuta* occurs in New Zealand.

8. **H. (E.) atricha** (no bristles), *R. Br. Prod.* 225; *Benth. Fl. Austr.* vii. 296. Stems slender, tufted, striate, under 1ft. high. Sheathing scale long, rather loose, oblique at the orifice. Spikelet linear, cylindrical, $\frac{1}{4}$ to $\frac{3}{4}$ in. long. Glumes obtuse, the dorsal midrib scarcely prominent, the margins with a very narrow scarious border and just within it a brown line. No hypogynous bristles. Style-branches 2. Nut much flattened, but convex on both sides, broadly obovate, elegantly pitted in numerous vertical rows, the base of the style surrounded by a very prominent border.—*F. v. M. Fragm.* viii. 252.

Hab.: Between Norman and Gilbert Rivers, *Gulliver*; also near Wallangarra.

9. **H. (E.) capitata** (headed), *R. Br. Prod.* 225; *Benth. Fl. Austr.* vii. 296. Stems usually densely tufted, from under 6in. to nearly 1ft. high, slender, striate. Inner leaf-sheath short, appressed or rather loose, oblique at the orifice. Spikelet ovoid-conical or nearly globose, pale-coloured, rarely above 2 lines diameter. Glumes numerous, all including the 1 or 2 outer empty ones very deciduous, ovate, obtuse, more or less scarious, with a broad more opaque or greenish centre or dorsal nerve scarcely forming a prominent keel. Style-branches 2 or rarely 3. Hypogynous bristles 5 to 8, longer or shorter than the nut. Nut obovoid, biconvex or the inner face nearly flat, shining, crowned by the very small persistent depressed base of the style.—*Kunth, Enum.* ii. 150; *Boeckl. in Linnæa*, xxxvi. 461; *F. v. M. Fragm.* viii. 240.

Hab.: Gulf of Carpentaria, *R. Brown*; Endeavour River, *Banks and Solander*.

The species is widely spread over the warmer regions of the New and the Old World.

10. **H. (E.) atropurpurea** (dark-purple), *Kunth, Enum.* ii. 151; *Benth. Fl. Austr.* vii. 296. Stems densely tufted, slender often filiform, 1 to 3in. high. Inner leaf-sheath appressed, the orifice oblique, acuminate or lanceolate, in some specimens scarious and at length lacerated, in others green. Spikelet ovate, slightly compressed, attaining about 2 lines in length and $1\frac{1}{2}$ line broad at the base, or in the smaller forms, 1 line long and $\frac{1}{2}$ line broad. Glumes loosely imbricate or almost spreading, not numerous, deciduous, acute, the keel prominent and green, the sides dark-brown and nerveless. Stamens 1 or 2. Style-branches 2. Hypogynous bristles usually 4 sometimes 5 to 8 in the typical form, and as long as the nut, very short or entirely wanting in some varieties. Nut small, obovate, biconvex, smooth and shining, at length dark-brown or black, crowned by the small depressed persistent base of the style.—*Boeckl. in Linnæa*, xxxvi. 458; *F. v. M. Fragm.* viii. 240.

Hab.: Brisbane River, *Bailey*.

Var. *scitiformis*. Stems filiform, under 2ft. high. Bristles very short or none.—*Carron's Creek, Carpentaria, Gulliver*; *Rockhampton, O'Shanesy*.

The species is spread over the tropical and temperate regions of the Old World.

4. FIMBRISTYLIS, Vahl.

(Styles fringed.)

(*Trichelostylis* and *Oncostylis*, *Nees*.)

Spikelets solitary capitate or irregularly umbellate, with several usually many flowers, all hermaphrodite or rarely the upper ones female only. Glumes imbricate all round the rhachis or rarely distichous, the lowest 1 or 2 rarely 3 or 4 empty. No hypogynous bristles. Stamens 3, 2 or 1. Style flattened and ciliate or slender, with a conical or bulbous-shaped base, articulate on the ovary and falling off with the style, or (in *Oncostylis*) remaining persistent on the ovary long after the style has fallen away; stigmatic branches 2 or 3, filiform. Nut obovoid globular or more or less flattened and biconvex, often much contracted at the base.—Tufted annuals or perennials, never so large as the larger *Scirpi*. Leaves narrow, radical or at the base of the stem, sometimes reduced to membranous or rather rigid sheathing scales. Inflorescence terminal. Involucral

bracts under the principal rays usually short, rarely 2 or 3 exceeding the inflorescence. Spikelets solitary on the stem or on the rays or rarely clustered, pale or dark brown or almost white, never black.

The genus extends all round the world, but chiefly in tropical or subtropical regions, and a larger proportion is Australian than in the case of *Scirpus* and *Heleocharis*.

SECT. I. **Heleocharoides**.—Spikelets solitary, terminal. Glumes imbricate all round.

Nut biconvex, with transverse raised lines or wrinkles. Style-branches 2 or rarely 3.

Spikelets erect, usually whitish.

One or two lower glumes empty.

Stems leafless but often intermixed with a very few leaves. Style-branches 2.

Stamen 1. Style glabrous

Stamens 3. Style ciliate

Leaves numerous, filiform. Style-branches 3.

About 4 lower glumes empty, all broad and obtuse. Stems leafless

Spikelet nodding, usually brown

Nut 3-angled or biconvex, smooth striate granular or tuberculate.

Style-brancher 3 or sometimes 2.

Spikelet oblong, lanceolate. Style-branches 3.

Spikelet about $\frac{1}{2}$ line broad. Leaves few or none. No involucrel bract. Nut tuberculate

Spikelet ovate or oblong. Style-branches 2.

Spikelet 1 to $\frac{1}{2}$ line broad. Nut tuberculate.

Leaves numerous, filiform. Flowers all hermaphrodite

Spikelet 2 lines broad. Nut (smooth?) rather broad. Leaves few, narrow

Spikelet 2 lines broad. Nut narrow-oblong, striate, and cancellate.

Stems leafless

Spikelet globular, erect. Style-branches 3. Leaves numerous.

Spikelet white, 2 to 3 lines diameter. Nut flattened, often surrounded by a hyaline wing

Spikelet brown, 1 to $\frac{1}{2}$ line diameter

Spikelet nodding, brown, ovoid or cylindrical, 3 lines diameter. Leaves long and flat

(See also 24, *F. leptoclada*, which has sometimes solitary spikelets).

SECT. II. **Abildgaardia**.—Spikelets solitary or few, flat with distichous glumes, or narrow and spiral in 2 or rarely 3 rows. Style-branches usually 3.

Spikelets solitary, narrow, usually spiral. Glumes long, cartilaginous, rigid with long recurved points

Spikelets often several, very flat, regularly distichous or slightly spiral.

Leaves few, narrow-linear, rigid. Spikelets solitary or rarely 2 or 3, pale or nearly white

Leaves numerous, narrow-linear. Stems 3 to 4 in. Spikelets 4 to 6, rich brown

Stems 1 to 2 ft. high, flattened. Spikelets solitary erect, deep-brown

SECT. III. **Dichelostylis**.—Spikelets several usually numerous. Glumes imbricate all round. Style-branches 2. Nut biconvex.

Tufted annuals, leafy at the base. Stems under 1 ft.

Nut smooth or very minutely striate or cancellate.

Style-bulb ciliate at the base, the hairs spreading or reflexed over the nut

Style-bulb glabrous

Nut with distinct longitudinal striæ or ribs and transversely cancellate.

Spikelets numerous, under 2 lines long

Perennials, often above 1 ft. high.

Nut with distinct longitudinal striæ or ribs and transversely rugose.

Style flat, ciliate. Leaves often numerous, glabrous.

Spikelets usually brown, about 3 lines

Nut smooth or rugose.

Style distinctly ciliate.

Stems leafless or with few leaves. Spikelets ovate-lanceolate, $\frac{1}{2}$ to 2 lines broad. Nut smooth

1. *F. acicularis*.

2. *F. acuminata*.

3. *F. punctata*.

4. *F. rhyticarya*.

5. *F. nutans*.

6. *F. pauciflora*.

7. *F. polytrichoides*.

8. *F. subbulbosa*.

9. *F. tetragona*.

10. *F. pterygosperma*.

11. *F. sphærocephala*.

12. *F. zyridis*.

13. *F. squarrosula*.

14. *F. monostachya*.

15. *F. Dallachyi*.

16. *F. recta*.

17. *F. velata*.

18. *F. æstivalis*.

19. *F. dichotoma*.

20. *F. diphylla*.

21. *F. ferruginea*.

Stems leafless. Spikelets ovate or at length oblong, 1 line broad.

Nut usually rugose 22. *F. denudata*.

Style slender, nearly glabrous. Nut minute, smooth.

Leaves filiform, often numerous. Spikelets ovate, 2 to 3 lines long 23. *F. cespitosa*.

SECT. IV. **Tricholestylis**.—Spikelets several, usually numerous (rarely solitary in *F. leptoclada*). Glumes imbricate all round. Style-branches 3 (except rarely in some *Glomeratæ*). Nut various.

SERIES I. **Oligostachya**.—Spikelets few, not clustered, occasionally solitary, above 2 lines long.

Stems long, leafless. Spikelets narrow. Nuts tuberculate.

Spikelets 1 or 2, erect 24. *F. leptoclada*.

SERIES II. **Polystachya**.—Spikelets usually numerous in more or less compound umbels, not clustered on the rays.

Spikelets ovate, about 3 lines long or more. Style ciliate. Nut broad. 25. *F. obtusangula*.

Spikelets rarely 2 lines long, globular ovate or lanceolate.

Spikelets globular, $\frac{3}{4}$ to $1\frac{1}{2}$ line diameter. Stamen usually 1 26. *F. miliacea*.

Spikelets narrow-lanceolate, very numerous, under 2 lines. Stamens

1 rarely 2 or 3 27. *F. microcarya*.

Spikelets narrow, acute, 2 to 4-flowered (flowers more than 6 in all the preceding species) 28. *F. cyperoides*.

SERIES III. **Glomeratæ**.—Spikelets more or less clustered on the rays of the umbel, and always a central cluster of 2 or more in lieu of the single central sessile spikelet. Leaves usually numerous.

Spikelets not above 2 lines long in clusters of 2 or 3, interspersed usually with a few solitary ones.

Leaves green, flaccid, flat. Spikelets rich brown, ovoid, about 2 lines long 29. *F. furva*.

Leaves subulate, rigid, shining. Spikelets brown, 1 to $1\frac{1}{2}$ line long 30. *F. cymosa*.

Spikelets in clusters of 3 to 10. Leaves and inflorescence silky-hairy.

Spikelets 2 lines long 31. *F. sericea*.

Spikelets clustered, umbellate, 4 to 5 lines long. Style-branches 3 32. *F. Neilsoni*.

SERIES IV. **Capitata**.—Spikelets collected in a single terminal head.

Glumes obtuse, membranous. Involucral bracts concealed under the head or rarely 1 prominent. Nut tuberculate 33. *F. capitata*.

SECT. V. **Oncostylis**.—Style bulbs persistent after the style has fallen but articulate on the nut and often at length deciduous.

Spikelets 6 to 10 in a terminal cluster. Leaf-sheaths ciliate at the orifice 34. *F. barbata*.

Spikelets in a slightly compound or simple umbel. Leaf-sheaths not ciliate 35. *F. capillaris*.

1. ***F. acicularis*** (needle-like), *R. Br. Prod.* 226; *Benth. Fl. Austr.* vii. 801. Stems tufted, filiform, 8 to 6 in. high, leafless except the sheathing scales, but occasionally intermixed with tufts of 2 or 3 filiform leaves. Spikelets solitary, white, erect, slightly compressed, 3 lines long or rather more, $1\frac{1}{2}$ line broad. Glumes imbricate all round but not numerous, oblong, almost acute, cartilaginous, nerveless except the 1 or 3-nerved keel, the lowest 1 or 2 glumes empty and broader. Stamen 1. Style glabrous; branches 2. Nut white, slightly compressed, marked with transverse raised wrinkles.—*F. australica*, Boeckl. in *Linnæa*, xxxviii. 384.

Hab.: Endeavour River, Banks and Solander; Dunk Island, M'Gillivray.

2. ***F. acuminata*** (pointed), *Vahl; Kunth, Enum.* ii. 221, var. *setacea*; *Benth. Fl. Austr.* vii. 801. Stems slender, densely tufted, 8 to 6 in. high, leafless except the sheathing scales at the base but frequently intermixed with tufts of 2 or 3 filiform leaves. Spikelet solitary, erect, narrow-oblong, 8 or sometimes 4 lines long, scarcely above 1 line broad in this variety. Glumes closely imbricate all round, lanceolate, acute, cartilaginous, the keel scarcely prominent but often 8-nerved, especially on the lower glumes, the lowest 1 or 2 glumes empty.

Stamens 3. Style slightly flattened and ciliate; branches 2. Nut obovate, biconvex, marked with transverse raised wrinkles.—*F. acuminata*, *B. minor*, Boeckl. in *Linnaea*, xxxvii. 4; *F. setacea*, Benth. in *Hook. Lond. Journ.* ii. 289.

Hab.: Moreton Bay, *F. v. Mueller*, Bailey; Fitzroy River, O'Shanessy; Rockingham Bay, Dallachy.

The typical *F. acuminata* has larger broader spikelets, the glumes more prominently keeled. It is spread over East India, Ceylon, and the Malayan Archipelago, the Australian variety is at least in the Archipelago.—Benth.

3. *F. punctata* (dotted), *R. Br. Prod.* 226; *Benth. Fl. Austr.* vii. 302. Apparently annual, tufted, the stems 6 to 9 in. high. Leaves much shorter, numerous, narrow-linear, almost setaceous with short open sheathing bases or the inner ones with short scarious sheaths. Spikelet solitary, erect, oblong, 4 to 5 lines long, $1\frac{1}{2}$ to 2 lines diameter, pale coloured. Glumes closely imbricate all round, rather rigid, above 2 lines long, obtuse but the broad prominent keel produced into a short erect very obtuse point, the sides smooth and veinless, 1 or 2 outer ones empty with rather longer points. Stamens 2 or 3. Style flattened, ciliate in the upper part; branches 3, short. Nut broadly obovate, biconvex, whitish with a few raised transverse ridges or wrinkles and minutely pitted all over.

Hab.: East coast, *R. Brown*.

In the specimens examined there certainly were 3 style-branches as described by Brown, although the nut showed no trace of a third angle or rib.—Benth.

4. *F. rhyticarya* (wrinkled-nut), *F. v. M. Fragm.* i. 215; *Benth. Fl. Austr.* vii. 302. Stems from 8 or 9 in. to above 1 ft. high, leafless except short rather loose sheathing scales at the base. Spikelet, solitary, erect, oblong-lanceolate or almost ovate-lanceolate, not at all or scarcely flattened, 4 to 6 lines long and 2 to $2\frac{1}{2}$ lines diameter at the base, pale-coloured or whitish. Glumes closely imbricate all round, cartilaginous, broad, obtuse or scarcely acute, often marked in the centre with 3 or 5 nerves but scarcely keeled and otherwise veinless, about 4 outer ones shorter and empty. Stamens 3. Style flattened, ciliate; branches 2. Nut obovate, but little compressed, marked with several raised transverse wrinkles.—*F. acuminata*, *F. v. M. Fragm.* viii. 274, not of Vahl.

Hab.: Burdekin River, *F. v. Mueller*; Rockingham Bay, Dallachy.

5. *F. nutans* (nodding), *Vahl*; *Kunth, Enum.* ii. 221; *Benth. Fl. Austr.* vii. 303. Stems tufted, slender, mostly above 1 ft. high, leafless except short appressed sheathing scales at the base. Spikelet solitary, terminal without any prominent subtending bract, but always more or less nodding, ovoid or ovoid-lanceolate, brown, 3 to 4 lines long, $1\frac{1}{2}$ to 2 lines broad. Glumes numerous, imbricate all round, thinly membranous almost hyaline, very broad and obtuse or the slightly prominent keel produced into a minute point, about 4 of the outer ones empty, the lowest often with a rather long point. Stamens 3. Style much dilated, ciliate; branches 2, one of them often bifid. Nut obovate, biconvex or nearly flat on the inner face, marked with transverse raised wrinkles and tubercles when fully ripe, or perhaps sometimes nearly smooth.—Boeckl. in *Linnaea*, xxxvii. 5; *R. Br. Prod.* 226; *F. v. M. Fragm.* viii. 274.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*; Sandy Cape, *R. Brown*; Brisbane River, *F. v. Mueller*, Bailey; Dawson River, *F. v. Mueller*.

Extends over East India and the Malayan Archipelago to South China.

6. *F. pauciflora* (flowers few), *R. Br. Prod.* 225; *Benth. Fl. Austr.* vii. 303. Stems densely tufted, filiform, 3 to 6 in. high or rarely more. Leaves few and filiform, or all reduced to sheathing scales with scarcely any lamina. Spikelets solitary, erect, very narrow-oblong, nearly white, about 2 lines long and $1\frac{1}{2}$ line broad. Glumes few but imbricate all round and very deciduous, cartilaginous, acute, keeled, the sides veinless, the 2 outer ones empty and more acuminate.

with the keel more or less distinctly 8-nerved. Stamen usually 1. Style not at all or scarcely ciliate; branches 3, rarely 2. Nut obovoid globular, 8-ribbed tuberculate or almost muricate.—*F. filiformis*, Kunth, Enum. ii. 221; Boeckel. in Linnæa, xxxvii. 28; *F. pumila*, Benth. in Hook. Lond. Journ. ii. 289.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*; Rockingham Bay, *Dallachy*. Also in the Malayan Archipelago and peninsula.

7. ***F. polytrichoides*** (Polytrichum-like), *R. Br. Prod.* 226; *Benth. Fl. Austr.* vii. 304. Stems densely tufted, slender, usually glabrous and only 2 or 3 in. high, but sometimes above 6 in. Leaves much shorter, numerous, filiform. Spikelets solitary, erect (or rarely a second lateral erect pedunculate one?), oblong, 2 to 3 lines long and scarcely above 1 line diameter, pale brown. Glumes numerous, imbricate all round, deciduous, oblong or ovate-oblong, obtuse, membranous almost hyaline, the midrib scarcely prominent except on the lower glumes where it is sometimes produced into a short point, 1 or rarely 2 outer empty glumes with longer points one sometimes as long as the spikelet. Stamens 1 or 2. Style scarcely flattened but hairy; branches 2. Nut obovate, biconvex, dark-coloured, tuberculate.—Kunth, Enum. ii. 221; *F. juncea*, Boeckel. in Linnæa, xxxvii. 4, partly, but probably not *Scirpus junceus*, Forst.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*; Moreton Bay, *F. v. Mueller*. Also in East Indian and the Malayan Archipelago.

8. ***F. subbulbosa*** (almost bulbose), *Benth. Fl. Austr.* vii. 305. Stems from a thick horizontal rhizome numerous, thickened and bulb-like at the base, slender, often 1½ ft. long. Leaves few narrow and short or almost reduced to sheathing scales. Spikelet solitary, erect, ovoid or oblong, about 4 lines long and 2 lines broad when full grown, light brown. Glumes numerous, imbricate all round, broadly ovate, obtuse or the keel slightly prominent, thin almost membranous, 3 or 4 outer ones empty shorter and sometimes more pointed. Stamens 3. Style flat, ciliate; branches 2. Nut obovate or oblong, biconvex, smooth.

Hab.: Rockingham Bay, *Dallachy*.

9. ***F. tetragona*** (4-angled), *R. Br. Prod.* 226; *Benth. Fl. Austr.* vii. 305. Stems 9 in. to above 1 ft. high, slender, often thickened into a bulb at the base, leafless except short loose sheathing scales at the base. Spikelets solitary, erect, ovoid, obtuse, 3 to 4 lines long and 2 lines diameter, the rhachis at length sometimes longer but denuded at the base, the lower glumes having fallen away. Glumes numerous, closely imbricate all round, oblong or rather broad, very obtuse, very finely striate but otherwise nerveless, thinly cartilaginous, 4 to 6 of the lower ones empty. Stamens 3. Style flattened, ciliate; branches 2 or rarely 3. Nut narrow-oblong, scarcely flattened, longitudinally striate and transversely cancellate.—*F. v. M. Fragm.* i. 194, viii. 274; *F. cylindrocarpa*, Kunth, Enum. ii. 222; Boeckel. in Linnæa, xxxvii. 7; *Trichelostylis pyroides*, Arn.; Hook. f. *Fl. Tasm. Præf.* 48.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*. Spreads over East India, Ceylon, and the Malayan Archipelago.

10. ***F. pterygosperma*** (seed winged), *R. Br. Prod.* 226; *Benth. Fl. Austr.* vii. 306. Stems tufted, slender but rigid, 6 in. to 1 ft. high. Leaves much shorter, with short broad open sheaths or the inner one with a longer closed sheath. Spikelet solitary, erect, almost globular or at length conical, 2 to 3 lines diameter. Glumes numerous, closely imbricate all round, cartilaginous, nerveless, white or the inner ones tipped with brown, all very obtuse and broad, especially the outer ones, of which 4 to 6 are empty and rather larger than the flowering ones. Stamens 2 or 3. Style much flattened but glabrous; branches

8, short. Nut broadly obovate, truncate, stipitate, more or less flattened with 8 prominent ribs, the two lateral ones often but not in all specimens fringed with a broad hyaline wing, marked with radiating striae, the dorsal rib never fringed.—Bœckel. in *Linnaea*, xxxviii. 888.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*.

11. **F. sphaerocephala** (round-headed), *Benth. Fl. Austr.* vii. 806. Stems densely tufted, filiform, 3 to 6 in. high. Leaves much shorter, numerous, filiform, glabrous or minutely pubescent, with short open sheaths. Spikelet solitary, erect, globular and 1 to 1½ line diameter, or at length ovoid and 2 lines long, brown. Glumes numerous, closely imbricate all round, broadly obovate or orbicular, obtuse, membranous almost hyaline, shortly ciliate, the midrib or keel slightly prominent and in the 1 or 2 outer empty glumes produced into a short point. Stamen 1. Style hairy but scarcely flattened; branches 3. Nut showing 8 prominent ribs.

Hab.: Sunday Island, near Cape York, *A. Cunningham*.

12. **F. xyridis** (Xyris-like), *R. Br. Prod.* 226; *Benth. Fl. Austr.* vii. 807. Stems slender but rigid, 1 to 1½ ft. high, pubescent at the base with short spreading hairs. Leaves rather numerous at the base of the stem and some half as long, flat and grass-like, shortly ciliate, the outer ones with short open sheaths, the innermost with a long close sheath. Spikelets solitary, nodding but terminal, ovoid or shortly cylindrical, very obtuse, 4 to 5 lines long, nearly 3 lines diameter, of a rich brown. Glumes very numerous and closely imbricate all round, obovate or orbicular, very obtuse, thinly membranous almost hyaline, the central nerve not prominent in the typical form and otherwise nerveless, the margins somewhat minutely pubescent, the 1 or 2 outer ones empty but nearly similar. Stamens 3, (or sometimes 2?). Style flattened but glabrous; branches 3. Nut oblong, triquetrous, smooth. Bœckel. in *Linnaea*, xxxviii. 889; *F. v. M. Fragm.* viii. 274.

Hab.: Islands and mainland of the Gulf of Carpentaria, *R. Brown*; Norman and Gilbert Rivers, *Gulliver*.

Var. *rigidula*. Glumes with a prominent rigid midrib and the spikelet apparently larger, but not fully out in the only specimen seen.

Hab.: Fitzroy Island, *Walter*.

13. **F. squarrulosa** (somewhat squarrose), *F. v. M. Fragm.* i. 216; *Benth. Fl. Austr.* vii. 808. Stems tufted, 1 to 1½ ft. high, slender, but rigid, leafless except the short erect subulate points of the sheathing scales, but intermixed with a few long narrow radical leaves. Spikelet solitary, erect, narrow-oblong, scarcely flattened, 6 to 9 lines long, scarcely 2 lines broad. Glumes not numerous, almost distichous or irregularly spiral, cartilaginous, the keel prominent and tapering into a spreading point, the sides nerveless or minutely striate, the longer flowering ones about 4 lines long, about 4 outer empty ones gradually shorter and broader. Stamens 3. Style scarcely dilated, minutely ciliate; branches 3. Nut stipitate, ovoid, slightly 8-ribbed, prominently tuberculate when quite ripe.—*Abildgaardia schoenoides*, *R. Br. Prod.* 229.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*.

14. **F. monostachya** (1-spiked), *Haask. Pl. Jav. Rar.* 61; *Benth. Fl. Austr.* vii. 808. Rhizome short, horizontal. Stems often thickened at the base, otherwise slender, from under 1 ft. to 1½ ft. high. Leaves shorter, very narrow. Spikelet solitary, erect, or rarely accompanied by a second or even a third pedicellate one, ovate or ovate-lanceolate, more or less flattened, pale or nearly white, 4 to 7 lines long, 2 to 3 lines broad. Glumes distichous or at length more or less spiral, cartilaginous, ovate, mostly 2 lines long, the keel prominent and produced into a short point, 1 or 2 lower empty ones narrow and more pointed.

Stamens 3. Style slightly dilated, ciliate; branches 3 or 2. Nut rather large, obovoid or globular, obtusely 3-angled, tuberculate or almost muricate.—*Abildgaardia monostachya*, Vahl; Kunth, Enum. ii. 247; Beckel. in Linnæa, xxxvii. 68; R. Br. Prod. 229; F. v. M. Fragm. viii. 272.

Hab.: East Coast, R. Brown; Port Curtis, M'Gillivray; Burnett River, F. v. Mueller; Rockhampton, O'Shanesy, Thozet; Herbert Creek, Bowman; Brisbane River, Moreton Bay, F. v. Mueller, Leichhardt, C. Stuart; towards Wallangarra.

The species extends over the tropical regions of the New and the Old World.

15. *F. Dallachyi* (after J. Dallachy), F. v. M.; Benth. Fl. Austr. vii. 309. A small tufted plant, apparently annual. Stems slender, 3 to 4 in. high. Leaves much shorter, rather numerous, narrow-linear but flat. Umbel simple, of 8 or 4 short filiform rays besides the sessile spikelet, the peduncles or rays shortly hirsute. Involucral bracts few and short. Spikelets very flat, lanceolate, acute, of a rich brown, about 3 lines long, 1 line broad, 8 to 12-flowered. Glumes very regularly distichous, navicular, lanceolate, acute, prominently keeled, the sides nerveless. Stamens 2 or 3. Style slender, shortly bulbous at the base, glabrous; branches 3. Nut obovoid, 8-ribbed, whitish, tuberculate.—*Abildgaardia fimbristylodes*, F. v. M. Fragm. viii. 273.

Hab.: Rockingham Hay, Dallachy.

16. *F. recta* (erect), Bail. 3rd. Suppl. Syn. Ql. Fl. 80. Stems erect from a shortly creeping knotted rhizome, $1\frac{1}{2}$ to 2 ft. high, rather slender, flattened, sulcate-striate and rather rough. Leaves somewhat distichous, 6 to 9 in. long, $1\frac{1}{2}$ line broad, the end blunt with a small point, rather thick and rigid, the margins slightly rough, sheaths rather loose, with a more or less broad hyaline margin, which is more conspicuous on the lower sheaths, which are wanting in lamina. Spikelet solitary, erect, ovate to ovate-lanceolate, slightly flattened, $\frac{1}{2}$ to 1 in. long, 4 or 5 lines broad. Glumes more or less spiral, ovate, about 3 lines long, very thin, almost hyaline, deep brown except the keel, which in the lower empty ones is often produced into a point. Stamens 3. Style slightly dilated, glabrous or nearly so, branches 2 or 3. Nut white, pyriform, with 3 angles and tuberculate between them.

Hab.: Near Northcote, R. C. Burton.

17. *F. velata* (clothed), R. Br. Prod. 227; Benth. Fl. Austr. vii. 309. Small densely tufted and apparently annual. Stems 3 to 6 in. high. Leaves much shorter, linear or setaceous, usually pubescent at least on the sheaths, rarely entirely glabrous. Umbel usually compound and rather compact, with slender rays and pedicels. Involucral bracts setaceous, much shorter than the inflorescence, or rarely 1 to 2 in. long. Spikelets solitary on the rays or pedicels, at first ovate-oblong and about 2 lines long, but often lengthening when old, scarcely 1 line broad, pale brown, glabrous or pubescent. Glumes rather closely imbricate all round, the very prominent keel produced into a short erect point. Stamen 1. Style slightly pubescent; the dilated base fringed with spreading hairs often long and closely reflexed over the ovary and nut; branches 2. Nut obovoid, usually brown, biconvex, minutely striate or cancellate.—Hook. f. Fl. N. Zel. i. 272; *F. dichotoma*, Hook. f. Handb. N. Zeal. Fl. 308, not of Vahl; *F. propinqua*, R. Br. Prod. 227.

Hab.: Wide Bay, Bidwill.

18. *F. festivalis* (of summer), Vahl; Kunth, Enum. ii. 226; Benth. Fl. Austr. vii. 310. Densely tufted and probably annual. Stems slender, 3 to 6 in. high or when luxuriant 8 or 9 in. Leaves much shorter, rather numerous, filiform, the sheaths and often the whole leaf pubescent or hirsute. Umbel nearly simple or compound, with filiform rays and pedicels. Involucral bracts

filiform, slightly dilated at the base, 1 or 2 longer than the inflorescence or all shorter. Spikelets solitary on the rays or pedicels, of a light brown, at first ovate and only 1 line long, at length oblong and sometimes 2 lines long, under 1 line broad. Glumes loosely imbricate all round, membranous, the keel prominent often ciliate and produced into a short point, 1 or 2 outer ones empty. Stamen 1 (rarely 2?). Style glabrous or slightly ciliate near end; branches 2. Nut obovate, biconvex, smooth or under a strong lens minutely reticulate.—Boeckl. in *Linnaea*, xxxvii. 11; *F. v. M. Fragm.* ix. 11; *F. pallascens*, Nees; Hook. f. *Fl. Tasm. Pref.* 48.

Hab.: Cape York, *M'Gillivray*; Rockingham Bay, *Dallachy*; Rockhampton and neighbourhood, *Bowman*, *O'Shanesy*; and towards Wallangarra.

Var. *macrostachya*. Spikelet ovate or ovate-lanceolate, 2 to 3 lines long, $1\frac{1}{2}$ line broad.

Hab.: Rockingham Bay, *Dallachy*; Russell River, *Herb. F. Mueller*.

The species ranges over tropical and subtropical Asia and the same or a very closely allied one is in America.

19. *F. dichotoma* (dichotomous), *Vahl*; *Kunth, Enum.* ii. 225; *Benth. Fl. Austr.* vii. 310. Densely tufted and apparently annual. Stems from a few in. to nearly 1 ft. high. Leaves shorter, rather numerous, very narrow-linear but flat, quite glabrous or the sheaths slightly ciliate. Umbel nearly simple or compound but not usually large, the longest rays $\frac{1}{2}$ to 1 in. Involucral bracts narrow-linear, 2 or 3 longer than the inflorescence. Spikelets ovate, from 1 to $1\frac{1}{2}$ line long. Glumes imbricate all round but not very numerous, ovate, membranous, with a very prominent keel produced into a short erect point. Stamen 1. Style flattened, ciliate but the base glabrous; branches 2. Nut broadly obovate, biconvex, with 10 to 12 prominent longitudinal striæ and transversely cancellate.—Boeckl. in *Linnaea*, xxxvii. 12; *Reichb. Ic. Fl. Germ.* t. 315; *F. v. M. Fragm.* ix. 10; *F. parviflora*, *R. Br. Prod.* 227.

Islands of the Gulf of Carpentaria, *R. Brown*; Brisbane River and Tarampa Creek, *Bailey*; Rockingham Bay, *Dallachy*; Herbert's Creek, *Bowman*; Moreton Bay, *C. Stuart*.

Extends over the warmer regions of both the New and the Old World.

20. *F. diphylla* (2-leaved), *Vahl. Enum.* ii. 289; *Benth. Fl. Austr.* vii. 311. Stems from a perennial rhizome tufted, rather slender, often compressed, $\frac{3}{4}$ to $1\frac{1}{2}$ ft. high, usually scabrous under the inflorescence. Leaves narrow-linear, from almost subulate to $1\frac{1}{2}$ line broad, rarely as long as the stem, mostly radical with short open sheaths. Umbel more or less compound or almost simple, loose with the longer rays 1 to 3 in., or crowded. Involucral bracts leafy, 1 or 2 often exceeding the inflorescence. Spikelets few or numerous, ovoid or oblong, usually brown and about 3 lines long and $1\frac{1}{2}$ line broad. Glumes closely imbricate all round, broad, rather rigid, shortly mucronate, the keel 1 or 3-nerved, the sides smooth. Stamen in the typical form 1, in some varieties 3. Style flattened, ciliate; branches 2. Nut obovate, much compressed but biconvex, whitish, distinctly striate and cancellate.—*F. variabilis*, *R. Br. Prod.* 228; *F. communis*, *Kunth, Enum.* ii. 284; *F. v. M. Fragm.* ix. 10; *F. polymorpha*, Boeckl. in *Linnaea*, xxxvii. 14; *F. elongata* and *F. stricta*, *R. Br. Prod.* 228; *F. gracilis*, *F. tristachya* and *F. obtusifolia*, Nees. in *Sieb. Agrostoth.* n. 2, 114, 117 (the two latter numbers West Indian).

Hab.: Gulf of Carpentaria, *R. Brown*; Port Curtis and Percy Island, *M'Gillivray*; Rockingham Bay, *Dallachy*; Rockhampton and neighbourhood, *Thozet*, *Bowman* and others; Moreton Bay, *F. v. Mueller*; Stanthorpe and many other localities.

The fungus-blight *Ustilago axicola*, *Berk.* often infests the inflorescence of this and closely allied species.

Var. *gracilis*. Leaves very narrow, glumes more membranous and paler coloured than in the ordinary form. Stamens usually 3.—*F. gracilis*, *R. Br. Prod.* 227.

Hab.: Keppel Bay, *R. Brown*.

The species is common in the warmer regions both of the New and the Old World, extending into North America.

21. *F. ferruginea* (rusty), Vahl; Kunth, Enum. ii. 236; Benth. Fl. Austr. vii. 812. Perennial, glabrous and smooth. Stems rigid, striate, often slightly compressed, 1 to 2 ft. high. Leaves few, the narrow-linear lamina often erect and shorter than the brown membranous sheath. Umbel simple or slightly compound. Involucral bracts few, either all very short or 1 or 2 slightly exceeding the inflorescence. Spikelets few, rarely reduced to 1 or 2 or increased to about 12, dark or light brown, always rather large but varying in size from 4 lines long and $1\frac{1}{2}$ line broad to above $\frac{1}{2}$ in. long and fully 2 lines broad. Glumes numerous, closely imbricate all round, broadly ovate or almost orbicular, membranous with a rather fine but prominent keel often produced into a short point, the sides nerveless or faintly striate, often minutely hoary-pubescent. Stamens 8. Style ciliate; branches 2. Nut obovate, much compressed but biconvex, usually with a thickened margin, quite smooth or under a strong lens very minutely striate and cancellate.—Böckel. in Linnaea, xxxvii. 16; F. v. M. Fragm. ix. 10; *F. brevifolia*, R. Br. Prod. 228.

Hab.: Rockingham Bay, *Dallachy*; Rockhampton, *Thozet* and others; Brisbane River, Moreton Bay, *F. v. Mueller*, *Leichhardt*.

Var. *foliata*. Leaves long though few and often only one, the sheaths often pubescent. Spikelets large.—*F. arvensis*, Vahl; Kunth, Enum. ii. 237; *F. tristachya*, R. Br. Prod. 228; *F. paucispicata*, F. v. M. Fragm. i. 197.

Hab.: Gulf of Carpentaria, *R. Brown*; Bowen Downs, *Birk*; Springsure, *Wuth*.

The species is dispersed over the warmer regions of the New and the Old World.

22. *F. denudata* (denuded), R. Br. Prod. 227; Benth. Fl. Austr. vii. 313. Perennial and glabrous. Stems densely tufted, slender but rigid, 6 in. to nearly 1 ft. high, leafless except short sheathing scales or very rarely intermixed with a very few long setaceous leaves. Umbels simple, of 3 to 6 spikelets or one of the lateral rays bearing 2 spikelets distant from each other, the branches or rays as well as the spikelets erect. Involucral bracts short and glume-like or rarely produced into a short point. Spikelets brown, at first ovate-oblong and about 2 lines long, at length nearly cylindrical and 3 to 5 lines, scarcely 1 line diameter. Glumes numerous, imbricate all round, ovate or oblong, obtuse or shortly mucronate, the keel very prominent, the sides membranous. Stamens 2 or 3. Style flattened, ciliate; branches 2. Nut minute, obovate, biconvex, smooth or under a strong lens slightly rugose.—F. v. M. Fragm. ix. 9.

Hab.: Between Norman and Gilbert Rivers, *Gulliver*.

23. *F. caespitosa* (tufted), R. Br. Prod. 227; Benth. Fl. Austr. vii. 313. Perennial. Stems 6 to 10 in. high, slender. Leaves very much shorter, rather numerous, setaceous. Umbel simple or slightly compound, the rays slender, $\frac{1}{2}$ to $\frac{3}{4}$ in. long. Involucral bracts very short and glume-like. Spikelets ovate or at length ovate-oblong, 2 to 3 lines long, nearly $1\frac{1}{2}$ line broad. Glumes numerous, closely imbricate all round, membranous, ovate, obtuse or scarcely mucronate, the keel very slightly prominent, with a lateral nerve on each side in the lower glumes. Stamens 2 or 3. Style slender, scarcely ciliate; branches 2. Nut minute, biconvex, pale or dark coloured, smooth or under a strong lens minutely striate and cancellate.—*F. brachyloma*, F. v. M. Fragm. i. 199.

Hab.: Gulf of Carpentaria, *R. Brown*; Sweers Island, *Henne*; Herbert River, *Armitage*.

24. *F. leptoclada* (branches slender), Benth. Fl. Austr. vii. 314. Perennial and glabrous. Stems densely tufted, filiform, 6 in. to 1 ft. long, leafless except the sheathing scales which are mostly scarious especially in the upper part. Spikelets either solitary or with 1 rarely 2 additional pedicellate ones, lanceolate, pale brown, 4 to 6 lines long, $1\frac{1}{2}$ to 2 lines diameter. Glumes imbricate all round, lanceolate or ovate-lanceolate, acuminate-acute, about 2 lines long, very thinly membranous almost scarious and hyaline on the sides, the keel prominent and sometimes a faint nerve on each side, about 2 lower ones shorter and empty and

often the uppermost empty or with imperfect flowers. Stamens 3. Style slender, nearly glabrous, more ciliate at the base; branches 8. Nut obovoid, 3-ribbed, white, tuberculate.

Hab.: Rockingham Bay, *Dallachy*; Rockhampton, *O'Shanesy*.

25. **F. obtusangula** (obtusely angled), *F. v. M. Fragm.* i. 198; *Benth. Fl. Austr.* vii. 315. Stems 1 to 1½ ft. high. Leaves numerous and short. Involucral bracts very short, the longest 3 to 5 lines long, rigid and almost pungent. Umbels slightly compound of few rays. Involucral bracts shorter than the rays. Spikelets 1 to 3 on each ray, pale brown, broadly ovate and about 3 lines long. Glumes numerous, imbricate all round, obtuse, with usually a nerve on each side of the keel. Stamens 3. Style flattened and ciliate. Nut broadly obovoid-clavate.

Hab.: Bowen Downs, *Birch*.

26. **F. milliacea** (Millet-like), *Vahl*; *Kunth, Enum.* ii. 230; *Benth. Fl. Austr.* vii. 316. Apparently annual. Stems tufted, slightly or very prominently 4-angled, 6 in. to about 2 ft. high. Leaves from much shorter to nearly as long, linear, tapering to a fine point; the sheathing base broad and open. Umbel compound, sometimes small with the longest ray about 1 in., sometimes above 6 in. long and very compound, the ultimate rays or pedicels usually horizontally spreading. Involucral bracts small and linear or rarely 1 nearly as long as the ray. Spikelets globular or nearly so, from ½ to nearly 1½ line diameter. Glumes numerous, closely imbricate all round, broadly ovate, membranous, obtuse or scarcely mucronate, the keel fine but prominent, and frequently a broad brown streak on each side, the margins pale, sometimes hyaline. Stamen 1. Style glabrous; branches 3. Nut small, obovoid, whitish, 3-ribbed, granular tuberculate or almost muricate.—*Bœckel. in Linnæa*, xxxvii. 43; *F. v. M. Fragm.* ix. 12; *Trichelostyles miliacea*, *Nees*; *Hook. f. Fl. Tasm. Pref.* 48.

Hab.: Between Norman and Gilbert Rivers, *Gulliver*; Rockhampton, *O'Shanesy*.

Hab.: Common in tropical Asia, the Mascarene Islands, and in tropical America.

27. **F. microcarya** (nut small), *F. v. M. Fragm.* i. 200; *Benth. Fl. Austr.* vii. 316. Apparently annual. Stems tufted, slender, angular, from 3 to 4 in. to above 1 ft. high. Leaves much shorter, rather numerous, flat and rather flaccid, from ½ line to nearly 1½ line broad, with short open sheathing bases. Umbel slender, irregular, but very compound, the rays and pedicels filiform, the longest rays 1 to 2 or rarely 3 in. long. Involucral bracts narrow and leafy but shorter than the rays. Spikelets not clustered but numerous, the smallest in the genus, brown, narrow-lanceolate, about ½ line long when first out, lengthening to 1 or 1½ line or very rarely rather longer when old, not ½ line broad, with 6 to 12 or rarely more flowers. Glumes loosely imbricate all round, acuminate, the point sometimes slightly spreading, the keel very prominent and sometimes slightly ciliate, especially in the outer ones, 1 only empty. Stamen 1. Style nearly glabrous, branches 3. Nut obovoid, whitish, with 3 prominent ribs, usually tuberculate.—*F. cyperoides*, *F. v. M. Fragm.* ix. 11, not of R. Br.

Hab.: Between Norman and Gilbert Rivers, *Gulliver*; Port Denison, *Fitzalan*; Boyd River and Dry-beef Creek, *Leichhardt*; Herbert's Creek, *Bowman*; Rockhampton and neighbourhood, *Thozet*, *O'Shanesy*; Springsure, *Wuth*.

28. **F. cyperoides** (Cyperus-like), *R. Br. Prod.* 228; *Benth. Fl. Austr.* vii. 317. Stems from a creeping rhizome, slender but rigid, 6 in. to above 1 ft. high. Leaves not numerous, very narrow or subulate, erect, with long open sheaths. Umbel compound, with filiform rays, the longest about 1 in. long. Involucral bracts few, subulate, the longest much shorter than the inflorescence. Spikelets not clustered, narrow, acute, brown, 2 to 3 lines long, ½ to ¾ line broad, with 2

to 4 flowers. Glumes imbricate all round, erect, lanceolate, acute, membranous, keeled, the flowering ones about 2 lines long, 2 or 3 outer ones shorter, and 1 or 2 small empty ones above the flowers. Stamens 8. Style glabrous or nearly so, the bulbous base continuous and falling off with it; branches 8. Nut ovoid-oblong, faintly 8-ribbed, whitish, rugose.—*F. cinnamome-torum*, Kunth, Enum. ii. 229; (Bœckel. in *Linnaea*, xxxvii. 35); *Abildgaardia cinnamometorum*, Thw. Enum. Pl. Zeyl. 347; *Abildgaardia fusca*, F. v. M. Fragm. viii. 278, not of Nees; *Fimbristylis biflora*, Bœckel. in *Linnaea*, xxxviii. 393.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*; Wide Bay, *Bidwill*; Rockingham Bay, *Dallachy*; Brisbane River and many other southern localities. Also in the East Indian Peninsula and in Ceylon.

29. ***F. furva*** (dark), *R. Br. Prod.* 228; *Benth. Fl. Austr.* vii. 318. Probably perennial, glabrous and not glaucous. Stems tufted, 4 to 8 in. high, slightly flattened. Leaves shorter, numerous, more or less spreading, linear, flat, obtuse, flaccid, 1 to 1½ line broad. Umbel small and dense but compound, with few short rays, the spikelets mostly in clusters of 2 or 3 but some solitary. Involucral bracts small and glume-like or 1 or 2 produced into short points. Spikelets brown, ovoid or ovoid-oblong, about 2 lines long. Glumes imbricate all round, broad, the keel prominent and produced into a point very short in the inner glumes, longer in the lower ones with frequently a nerve on each side, the broad sides membranous and smooth. Stamens 2 or 3. Style slender, ciliate in the upper part; branches 8. Nut not seen full grown.

Hab.: Booby Island, *Banks and Solander*; Rockingham Bay, *Dallachy*.

30. ***F. cymosa*** (cymose) *R. Br. Prod.* 228; *Benth. Fl. Austr.* vii. 318. Perennial and glabrous. Stems slender but rigid, 2 to 1½ ft. high. Leaves much shorter, numerous at the base, narrow, erect, rigid and shining. Umbel compound, the rays and pedicels spreading. Involucral bracts lanceolate, with fine points or laminae much shorter than the rays. Spikelets numerous, in clusters of 2 or 3 with solitary ones intermixed, ovoid, 1 to 1½ line long, pale brown. Glumes not numerous, loosely imbricate all round, membranous, keeled, the lower ones acute or acuminate, the upper ones obtuse. Stamens usually 8. Style slender, not ciliate; branches 8. Nut very small, acutely 8-angled, smooth or minutely granular.

Hab.: Islands of the Gulf of Carpentaria and Prince of Wales' Island, *R. Brown*.

31. ***F. sericea*** (silky), *R. Br. Prod.* 228; *Benth. Fl. Austr.* vii. 319. Rhizome or stock thick and covered with the remains of old leaf-sheaths. Stems 6 in. to 1 ft. high, rigid, angular, striate, silky-pubescent or at length glabrous. Leaves much shorter, crowded at the base of the stem, linear, thick, 1 to 2 lines broad, obtuse, silky-pubescent on the underside and sheaths. Umbel irregularly compound, the longer rays about 1½ in., the spikelets in little clusters of 8 to 10. Involucral bracts lanceolate, acuminate, silky-hairy, much shorter than the rays. Spikelets about 2 lines long, with 2 or 3 perfect flowers. Glumes lanceolate or ovate-lanceolate, acute, navicular, prominently keeled, the sides nerveless, 2 outer ones shorter and empty and 1 or 2 upper ones also empty. Stamens 8. Style very shortly hairy; branches 8 (or 2). Nut not seen.—Bœckel. in *Linnaea*, xxxvii. 22.

Hab.: Gulf of Carpentaria, *R. Brown*.

32. ***F. Neilsoni*** (after — Neilson), *F. v. M. Fragm.* ix. 79; *Benth. Fl. Austr.* vii. 316. Glabrous. Stems 1 ft. high or more. Leaves shorter, narrow, with broad scarious sheaths obtuse at the orifice. Spikelets large, in a dense cluster of 3 to 5, with 2 or 3 short lateral rays or pedicels, bearing each 3 or 4, forming a simple umbel. Involucral bracts rarely longer than the inflorescence.

Spikelets ovate, 4 to 5 lines long. Glumes rather loosely imbricate, ovate, obtuse, membranous, hyaline towards the margin, the lower ones 2 lines long. Stamens 3. Style slender, glabrous; branches 3. Nut clavate-pyriform, 3-angled, pale-coloured, tuberculate.

Hab.: Barcoo River, Neilson; between Roma and the Barcoo, Birch.

33. **F. capitata** (headed), R. Br. Prod. 228; Benth. Fl. Austr. vii. 316. Stems tufted, rather slender, often 1 ft. high. Leaves much shorter, few, linear, with short open sheaths, or reduced to sheathing scales. Head of spikelets dense and globular, 4 to 6 lines diameter, either terminal concealing the very short bract, or appearing lateral owing to the involucrel bract continuing the stem and sometimes twice as long as the head, or the inflorescence proliferous emitting a short branch with a second head. Spikelets brown, ovate or oblong, 2 to 3 lines or when old 4 lines long, 1½ to 2 lines broad. Glumes loosely imbricate in few rows, membranous, prominently keeled, obtuse or minutely pointed, the sides nerveless, 1 or sometimes 2 smaller outer ones empty. Stamens 3. Style glabrous or nearly so, the basal dilatation very small; branches 3. Nut obovoid-globular, the angles not prominent, tuberculate.—*F. cephalophora*, F. v. M. Fragn. i. 196.

Hab.: Endeavour River, Banks and Solander.

34. **F. barbata** (bearded), Benth. Fl. Austr. vii. 321. Apparently annual. Stems tufted, filiform, 3 to 8 in. high. Leaves much shorter, filiform, the sheaths loose at the apex and ciliate or bearded with long hairs. Spikelets 6 to 10 together in a single terminal sessile cluster or head. Involucrel bracts few, filiform, 1 rather longer than the head. Spikelets brown, erect, narrow, 2 to 3 lines long. Glumes not numerous, erect, loosely imbricate, the very prominent usually 3-nerved and pale-coloured keel produced into a slightly recurved point, the sides membranous, almost scarious, nerveless. Stamen usually 1. Style glabrous; branches 3. Nut obovoid, slightly granular, the minute bulbous base of the style long persistent, but articulate on the nut and sometimes falling away at maturity.—*Scirpus barbatus*, Rothb.; Boeckl. in Linnæa, xxxvi. 751; *Isolepis barbata*, R. Br. Prod. 222; Kunth, Enum. ii. 208; F. v. M. Fragn. ix. 7.

Hab.: Gulf of Carpentaria, R. Brown; Bustard Bay, Banks and Solander; Rockingham Bay, Dallachy; Dawson River, F. v. Mueller; Dry-beef Creek, Leichhardt; Gainsford, Bowman; Bowen Downs, Birch.

Widely spread over the tropical regions of the Old World.

35. **F. capillaris** (like hair), A. Gray, Man. Bot. N. U. S. ed. 5. 567; Benth. Fl. Austr. vii. 322. Annual. Stems tufted, filiform, 3 to 9 in. high. Leaves much shorter, numerous, filiform. Umbel simple or slightly compound, of few short filiform rays. Involucrel bracts small and glume-like, or 1 or 2 produced into a filiform point shorter than the inflorescence. Spikelets ovoid-oblong, about 2 lines long, not clustered. Glumes not numerous, loosely imbricate, the keel very prominent, pale-coloured, produced into a minute slightly spreading point, the sides brown and nerveless. Stamens 2 or 3. Style slender, glabrous; branches 3. Nut small, obovoid, prominently 3-angled, very obtuse, the minute bulbous base of the style articulate but long persistent, usually however falling off at maturity.—*Scirpus capillaris*, Linn.; Boeckl. in Linnæa, xxxvi. 759; *Isolepis capillaris*, Roem. et Schult.; Kunth, Enum. ii. 211; F. v. M. Fragn. ix. 7.

Hab.: Rockingham Bay, Dallachy; Sandy Creek, Herb. v. Mueller.

Widely spread over the tropical and subtropical regions of the New and the Old World, extending into the more temperate districts of North America.

5. **SCIRPUS**, Lian.

(From the Celtic for Rushes.)

(Isolëpis, R. Br.; Malacochæte, Nees.)

Spikelets clustered, irregularly umbellate or rarely solitary, with several usually many hermaphrodite flowers. Glumes imbricate all round the rachis, all flowering or the lowest 1 rarely 2 empty. Hypogynous bristles none or 3 to 8, ciliate with minute reflexed hairs or flattened into plumose scales. Stamens 3, 2 or 1. Style deciduous, more or less divided into 2 or 3 filiform stigmatic branches, the base scarcely thickened, continuous with the nut and remaining as a small point or tubercle. Nut obovoid globular triquetrous or flat.—Small tufted annuals or if perennials sometimes tall and stout, the rhizomes often creeping or sometimes slender long and floating. Leaves few at the base of the stems or in tufts on the rhizome; sometimes reduced to an appressed sheath with or without a short lamina, sometimes very long. Inflorescence sometimes terminal with 2 or more unequal long involucre bracts as in *Cyperus*, more frequently more or less lateral with 1 erect involucre bract continuing the stem, in a few species the bract subtending the solitary terminal spikelet is short and glume-like.

The genus is truly cosmopolitan, thriving alike within the tropics, and in Arctic, Antarctic and Alpine regions, mostly in marshes, sometimes actually in water, rare in dry localities.

I have followed Asa Gray and Boeckler in reuniting *Isolëpis* with *Scirpus*, for the sole character by which they are distinguished, the absence of the bristles in the former, is variable in two or three species, and in other instances separate species so closely allied that Boeckler has united them as varieties. In the great majority of species however the character is so constant and so frequently attended by a difference in inflorescence, that their is a convenience in retaining the two groups at least as artificial sections. On the other hands, Nees' section or genus *Oncostylis*, retained by Boeckler in *Scirpus*, appears to me to be much more naturally referred by Asa Gray to *Fimbristylis*, of which it has the inflorescence, and the bulbous base of the style, although often long persistent on the nut, is articulate with it, and often falls off from the perfectly ripe fruit.—Benth.

SECT. I. *Isolëpis*.—No hypogynous bristles (except very rarely in *S. supinus*). Small or slender plants (except the last few species).

Spikelets solitary. Style-branches 2. Nut biconvex. Stamens usually 3. Spikelet narrow, few-flowered, 1 to 2 lines long. Stem or filiform rhizome often elongated and floating

1. *S. fluitans*.

Spikelets solitary or clustered, small, (1 to 2 lines) ovoid or ovoid-oblong, terminal or nearly so. Style-branches 3 rarely 2. Stamens 3 rarely 2. Glumes prominently keeled.

Nut very small, obovoid, globular or 3-ribbed; marked with longitudinal furrows. Spikelets 1 to 3

2. *S. setaceus*.

Stamens 1 or 2. Spikelets clustered. Glumes narrow with long recurved points. Nut very narrow

3. *S. squarrosus*.

Stamen 1. Spikelets usually clustered, sometimes proliferous. Glumes broad. Nut acutely triquetrous.

4. *S. inundatus*

Spikelets clustered, above 2 lines long, oblong or narrow. Style-branches 3. Spikelets in a terminal frequently proliferous cluster

5. *S. prolifer*.

Spikelets in a lateral cluster. Stems continuous, not thick. Spikelets few in the cluster. Nuts transversely wrinkled.

6. *S. supinus*.

Stems pithy with transverse septa inside. Spikelets in dense clusters. Nuts smooth

7. *S. articulatus*.

Spikelets small and very numerous in a dense globular lateral cluster

8. *S. nodosus*.

SECTION II. *Euscirpus*.—Hypogynous bristles 3 to 8. Plants mostly tall and stout.

Spikelets in sessile lateral clusters.

Stems terete. Style-branches 2. Nut flat. 9. *S. debilis*.

Stem acutely 3-angled. Style-branches 3.

Spikelets many. Glumes entire. 10. *S. mucronatus*.

Spikelets in a terminal or nearly terminal simple or compound irregular umbel or cluster.

Involucre bracts very short, erect and rigid. Style-branches 2.

Bristles filiform, with short reflexed cilia. 11. *S. lacustris*.

- Bristles or scales flattened, plumose with lax hairs 12. *S. littoralis*.
 Involucral bracts several, unequal, leaflike. Style-branches 3.
 Spikelets few and large (6 to 7 lines). Hypogynous bristles short . . . 13. *S. maritimus*.
 Spikelets very numerous in a compound inflorescence 3 to 4 lines long.
 Hypogynous bristles very long, capillary and flexuose 14. *S. polystachyus*,
 Spikelets sessile and pedicellate, $\frac{1}{2}$ in. long, ovoid, brown. Hypogynous
 bristles 6 or fewer, linear-brown, scabrous or setose 15. *S. grossus*.

1. ***S. fluitans*** (floating), Linn.; Bæckel. in *Linnaea*, xxxvi. 485; Benth. *Fl. Austr.* vii. 925. Rhizomes filiform, elongated when in water and floating in large masses with tufts of 2 or 3 leaves at the nodes, when growing out of water the rhizome scarcely developed. Leaves filiform, 1 to 2 in. long, dilated at the base into a short open sheath. Stems or peduncles about the length of the leaves, one in each tuft. Spikelet solitary, terminal, pale-coloured or dark-brown, ovate-oblong, $1\frac{1}{2}$ to 2 lines long with 4 to 8 flowers in the typical form. Glumes obtuse or scarcely acute, finely or obscurely striate, with a dorsal keel, all flowering except the lowest which is similar to the others or rather longer, very rarely produced into an erect linear lamina of 2 or 3 lines. Stamens 3. Style-branches 2. Nut ovate or broad, usually white, biconvex, tipped by a very small point or tubercle.—Reichb. Ic. Fl. Germ. t. 298; *Isolepis fluitans*, R. Br. Prod. 221; Kunth, Enum. ii. 188; Hook. f. Fl. Tasm. ii. 86.

Hab.: Border of N.S.W. towards Wallangarra.

The species is spread over the tropical and temperate regions of the Old World.

2. ***S. setaceus*** (bristle-like), Linn.; Bæckel. in *Linnaea*, xxxvi., 500 partly; Benth. *Fl. Austr.* vii. 927. Stems tufted, filiform or subulate, mostly 1 to 8 in. but sometimes 6 to 8 in. long. Leaves few, short and filiform. Spikelets solitary or 2 or 3 together, terminal or more frequently thrown to one side, the principal and only involucral bract erect and continuing the stem, sometimes very short, sometimes $\frac{1}{2}$ in. long. Spikelets ovate or lanceolate, $1\frac{1}{2}$ or rarely 2 lines long. Glumes few, the keel prominent and often produced into a very short point, the sides nerveless or faintly-nerved, brown or more frequently pale-coloured. No hypogynous bristles. Stamens 3, rarely 2. Style-branches 3. Nut small, globular or obovoid, more or less distinctly 8-ribbed and marked by longitudinal striæ or furrows.—Reichb. Ic. Fl. Germ. t. 301; *Isolepis setacea*, R. Br. Prod. 222; Kunth, Enum. ii. 198; Hook. f. Fl. Tasm. ii. 88; *I. multicaulis*, Schlecht. *Linnaea*, xx. 562.

Hab.: Southern localities near border of N.S.W.

3. ***S. squarrosus*** (squamose), Linn.; Bæckel. in *Linnaea*, xxxvi. 784, var. *Dietrichia*; Benth. *Fl. Austr.* vii. 329. Stems slender, tufted, 3 to 6 in. high or rarely more. Leaves shorter, setaceous. Spikelets 3 to 6 together in a terminal cluster. Involucral bracts usually 3, spreading, linear-subulate, one usually 1 to 2 in. long, the others much shorter. Spikelets ovoid-conical, $1\frac{1}{2}$ to 2 lines long or at length rather elongated with the lower glumes very deciduous so as to appear pedicellate. Glumes very numerous, linear or somewhat cuneate, 3-nerved, tapering into a long recurved point. No hypogynous bristles. Stamens 1 or 2. Style short; branches 2 or 3; Nut in the Australian variety very narrow, almost linear, slightly compressed.—*Scirpus Dietrichia*, Bæckel. in *Flora*, 1875, 109 (from the char. given).

Hab.: Rockhampton, *Amalia Dietrich*.

The species (*Isolepis squarrosa*, Roem. et Schult.; Kunth, Enum. ii. 202), extends over tropical Asia and Africa, but the nut is there usually broader and shorter than in our Australian specimens.—Benth.

4. ***S. inundatus*** (found in inundated localities), Spreng. *Syst.* i. 207; Benth. *Fl. Austr.* vii. 929. A very variable plant, sometimes dwarf and slender, sometimes elongated with the proliferous inflorescence of *S. prolifer*. Stems slender,

often filiform, and when thicker much less so than in *S. prolifer*, from scarcely above lin. to near 1ft. long, with usually a single short leaf, sometimes reduced to a sheath with a small point. Spikelets 3 to 6 or more together in a terminal cluster, the involucre bracts shorter or one more frequently subulate and longer than the cluster, rarely attaining $\frac{1}{2}$ in. Spikelets ovate-oblong, rather acute, rarely above 2 lines long, usually brown. Glumes concave, ovate, obtuse or the scarcely prominent keel produced into a short point, the sides striate with dark streaks or slightly prominent nerves or quite smooth, rarely pale-coloured throughout, and then often dotted. No hypogynous bristles. Stamens always 1 only and very frequently the filament persistent at the back of the nut. Style-branches 3; rarely 2. Nut rather broad, equally and prominently 3-angled or more or less flattened, smooth, the terminal point minute.—*Isolepis imundata* and *I. propinqua*, R. Br. Prod. 222; *I. prolifera*, Hook. f. Fl. Tasm. ii. 87, t. 144, not of R. Br.; *I. conspersa*, Nees in Endl. Prod. Pl. Norf. 23; *I. Guadichaudiana*, Kunth, Enum. ii. 201; *I. Urvillei* and *I. Gunnii*, Steud. Syn. Glum. ii. 94; *Scirpus conspersus* (partly), *S. Urvillei*, *S. costatus* (partly), and *S. Guadichaudii*, Boeckel. in *Linnaea*, xxxvi. 505, 510, 511.

Hab.: Brisbane River, Moreton Bay, *F. v. Mueller*; towards Wallangarra also.

5. *S. prolifer* (proliferous), *Rottb. Descr. et. Ic. Pl.* 55, t. 17, f. 2; *Benth. Fl. Austr.* vii. 880. Stems tufted or shortly creeping at the base, from a few inches to above 1ft. long, weak, but much thicker than in *S. imundatus*, leafless except a sheathing scale oblique at the orifice. Spikelets several, often many, in a terminal cluster or head which is often proliferous emitting 1 or more short branches of $\frac{1}{2}$ to 2 in., terminating in a small cluster of spikelets. Involucre bracts short and glume-like, concealed under the cluster. Spikelets oblong, 2 to 4 lines long, pale-coloured. Glumes ovate, obtuse, scarcely striate, but marked with longitudinal brown lines. No hypogynous bristles. Stamens usually if not always 3. Style-branches 3. Nut short, prominently 3-angled, smooth or minutely granular, the terminal point very small.—Boeckel. in *Linnaea*, xxxvi. 692; *Isolepis prolifera*, R. Br. Prod. 223; Kunth, Enum. ii. 201.

Hab.: Towards Wallangarra.

6. *S. supinus* (prostrate, with face turned upward), *Linn.*; *Boeckel. in Linnaea*, xxxvi. 699, excl. var. β and γ .—Stems tufted, decumbent or erect, striate, from 2 or 3 in. to above 1ft. long, leafless except a rather long sheathing scale often produced into a short narrow lamina. Spikelets 2 to 6 together in a lateral cluster, the outer involucre bract erect and continuous with the stem often 2 in. long and only slightly dilated at the base. Spikelets oblong, 2 to 4 lines long. Glumes prominently keeled, acute or the keel produced into a conspicuous point, loosely imbricated and generally very deciduous. Hypogynous bristles none or very short and few. Stamens 2 or 3. Style-branches 3. Nut broad, prominently 3-angled, or rarely biconvex, prominently marked with transverse wrinkles.—Reichb. Ic. Fl. Germ. t. 302; *Isolepis supina*, R. Br. Prod. 221; Kunth, Enum. ii. 196; *F. v. M. Fragm.* ix. 6.

Hab.: Keppel Bay, *R. Brown*; Brisbane River, *Bailey*.

Widely spread over the tropical and temperate regions of the Old World, more rare in the Southern states of North America.

7. *S. articulatus* (jointed), *Linn.*; *Boeckel. in Linnaea*, xxxvi. 702; *Benth. Fl. Austr.* vii. 881. Stems terete, hollow, more or less distinctly septate inside so as to appear articulate, 2 or 3 in. to 2ft. high. Spikelets numerous in a dense lateral cluster, the involucre bract erect and continuous with the stem, precisely like it and often as long as or longer than the true stem. Spikelets ovoid or oblong, 3 to 6 lines long, 2 lines diameter at the base or rather more, pale brown. Glumes broad, rather acute or mucronate, slightly striate, the keel scarcely

prominent. Hypogynous bristles none or rarely few or minute. Stamens 3. Style-branches 3. Nut prominently and acutely 3-angled.—*Isolepis articulata*, Nees; Kunth, Enum. ii. 199; *I. praelongata*, Nees; Kunth, l.c. 199; F. v. M. Fragm. ix. 6.

Hab.: Near Rockhampton, Thozet.

Common in tropical Asia and Africa.

8. *S. nodosus* (knotty), Rottb. Descr. et Ic. Pl. 52, t. 8 f. 3; Benth. Fl. Austr. vii. 381. Rhizome creeping. Stems rigid, rush-like, terete or slightly flattened, 1 to 3 ft. high; leafless except the sheathing scales at the base. Spikelets small and numerous, in a dense globular lateral head varying from 3 to 9 lines diameter, the rigid erect involucrel bract continuing the stem $\frac{1}{2}$ to $1\frac{1}{2}$ in. long. Spikelets ovoid, 2 to 3 lines long in the ordinary form, about 2 lines diameter, of a dark brown. Glumes broadly ovate, obtuse or scarcely mucronate, their base rather rigid almost scarious, neryeless or finely nerved, the keel scarcely prominent. No hypogynous bristles, but the torus slightly produced within the stamens into a minutely 3-toothed. Style-branches 3. Nut short, broad, smooth and shining, the inner face flat, the back more or less distinctly angled.—Bœckel. in Linnæa, xxxvi. 718; *Isolepis nodosa*, R. Br. Prod. 221; Kunth, Enum. ii. 199; Nees in Pl. Preiss. ii. 73; Hook. f. Fl. Tasm. ii. 87; Rich, Fl. Nov. Zel. t. 18; F. v. M. Fragm. ix. 6.

Hab.: Stradbroke Island, F. M. B.

The species is also in New Zealand, South Africa, and extratropical South America.

The first three species have nearly the habit of the last two or three of the section *Isolepis*, the others are all tall and stout. The *S. acicularis*, with the habit of the small slender species of *Heleocharis* or *Fimbristylis*, but with the characters of *Euscirpus*, so common in the temperate regions of the northern hemisphere, has not yet been found in Australia.

9. *S. debilis* (weak), Pursh; Kunth, Enum. ii. 159; Benth. Fl. Austr. vii. 382. Very nearly allied to *S. supinus*, and referred to it as a variety by Bœckeler; but differs in the glumes and nuts as well as in the bristles. Stems often 1 ft. high or more, erect, less rigid than in the following species but more so than in *S. supinus*. Spikelets lateral, in close clusters of 2 or 3 or solitary, the erect involucrel bract continuing the stem. Spikelets ovoid or ovoid-oblong, 3 to 5 lines long, 2 to 3 lines diameter. Glumes numerous, closely imbricate, not at all or scarcely deciduous, broad almost orbicular, concave, keeled only at the summit, obtuse or minutely pointed. Hypogynous bristles 4 to 6, longer or shorter than the nut. Stamens 2. Style-branches 2. Nut much flattened, minutely rugose or dotted in Indian and American specimens, almost muricate in the Australian ones examined.—*S. juncoides*, Roxb.; Kunth, Enum. ii. 160; *S. supinus*, var. β . and γ . Bœckel. in Linnæa, xxxvi. 700, 701.

Hab.: Gainsford, Bowman.

Also in East India and North America.

10. *S. mucronatus* (pointed), Linn.; Kunth, Enum. ii. 161; Benth. Fl. Austr. vii. 382. Stems tufted, stout, very acutely 3-angled, 1 to 3 ft. high, leafless except the sheathing scales at the base, the innermost ones sometimes produced into a short point. Spikelets rather numerous, in a dense lateral sessile cluster; the erect involucrel bract perfectly continuous with the stem and 1 to 2 in. long. Spikelets ovoid-oblong, 4 to 6 lines long, 2 to 3 lines diameter, pale brown. Glumes ovate, concave, obtuse or almost acute, membranous, more or less striate, the keel prominent and often green in the upper part. Hypogynous bristles 6 or fewer, usually longer than the nut. Style-branches 3. Nut rather small, generally dark coloured, the broad inner face flat, the back convex or angled.—R. Br. Prod. 229; Reichb. Ic. Fl. Germ. 303; Bœckel. in Linnæa, xxxvi. 703; F. v. M. Fragm. ix. 8.

Hab.: Brisbane River, Moreton Bay, F. v. Mueller, C. Stuart, Bailey; Daintree River, Fitzalan; Burnett River, F. v. Mueller; Rockingham Bay, Dallachy.

Also in tropical and temperate Asia and in Europe.

11. *S. lacustris* (a swamp plant), *Linn.*; *Kunth, Enum. ii. 164*; *Benth. Fl. Austr. vii. 888*. Stems stout, 2 to 5 ft. high, terete or obtusely triquetrous at the apex, leafless except a long loose sheathing scale sometimes continued into a short erect lamina. Spikelets numerous in an irregularly compound umbel appearing lateral, but the erect involucrel bract continuing the stem usually much shorter than the inflorescence, nearly terete, channelled on the inner side and dilated at the base. Spikelets ovoid and about 4 lines long or at length oblong-cylindrical and $\frac{3}{4}$ in. long, brown coloured. Glumes numerous, scarious, usually very broad, scarcely keeled except at the end, very obtuse and often emarginate, with or without a short point in the notch. Hypogynous bristles 6 or fewer, minutely ciliate, with reversed hairs as in the majority of the section, mostly shorter than the nut. Stamens 3. Style-branches 2. Nut broad, much flattened, tipped with a small point or tubercle.—*Bœckel. in Linnæa, xxxvi. 712*; *R. Br. Prod. 228*; *Reichb. Ic. Fl. Germ. x. 806*; *F. v. M. Fragm. ix. 7*; *S. Meyenii*, *Nees in Pl. Preiss. ii. 75*.

Hab.: Port Denison, *Fitzalan*; Barcoo Downs, *Birch*; Rockhampton, *Thozet*.

Extends over both the New and the Old World, chiefly in extratropical regions.

12. *S. littoralis* (sea-side plant), *Schrad.*; *Kunth, Enum. ii. 166*; *Benth. Fl. Austr. vii. 884*. "Kalpara," and "Pa-ral," Cooktown; "Pro-atha," Batavia River; "Au-gutanara," Red Island; *Roth*. A tall stout species, with the habit and inflorescence of *S. lacustris*. Stems terete or 8-angled towards the apex, 2 to 5 ft. high, leafless except the sheathing scales at the base often ending in short erect laminae. Umbel looser and less compound than in *S. lacustris*, with fewer spikelets, the erect involucrel bract continuing the stem short or as long as the inflorescence, channelled along the inner side or more distinctly triquetrous. Spikelets oblong or cylindrical, often above $\frac{1}{2}$ in. long when full-grown and about 2 lines diameter. Glumes broad, scarious, often pale-coloured, entire or slightly emarginate. Hypogynous bristles or scales 4 or rarely 5 or 6, much flattened, plumose with soft rather long hairs directed upwards. Stamens usually 3. Style-branches 2. Nut broad, much flattened, tipped by a small point or tubercle. *Reichb. Ic. Fl. Germ. 809*; *F. v. M. Fragm. ix. 7*; *S. plumosus*, *R. Br. Prod. 223*; *S. triquetus*, *Gren. et Godr. Fl. Fr. iii. 978*; *Bœckel. in Linnæa, xxxvi. 716*; not of *Linn.*; *Malaccchate littoralis*, *Nees*.

Hab.: Gulf of Carpentaria, *R. Brown, F. v. Mueller*; Breadsound, *R. Brown*; Brisbane River, Moreton Bay, *C. Stuart, Hume*.

Also in the Mediterranean region.

Roots eaten after roasting and hammering.—*Roth*.

13. *S. maritimus* (a sea-side plant), *Linn.*; *Kunth, Enum. ii. 167*; *Benth. Fl. Austr. vii. 885*. Rhizome creeping, often thickened into hard tubers. Stems 1 to 3 ft. high, triquetrous, smooth or slightly scabrous. Leaves often longer. Spikelets solitary or 3 together on each peduncle, forming sometimes a terminal irregular umbel of few unequal rays, sometimes contracted into a sessile cluster. Involucrel bracts few, the lowest long leafy and erect, apparently continuing the stem, the others short or one or two of them long and leaf-like. Spikelets in the Australian varieties ovoid or ovoid-oblong, 6 to 9 lines long, 3 to 4 lines diameter. Glumes broad, brown and scarious, the midrib or keel 1 or 3-nerved and produced into an erect or recurved point or awn, the broad scarious nerveless sides jagged at the end or forming 2 lobes shorter than the awn. Hypogynous bristles 6 or fewer, mostly shorter than the nut. Stamens 2 or 3. Style-branches 3 or rarely 2. Nut in the typical form broad, usually black when ripe, the inner face flat or nearly so, the back convex or obtusely angled.—*Bœckel. in Linnæa, xxxvi. 722*; *R. Br. Prod. 224*; *Hook. f. Fl. Tasm. ii. 89*; *F. v. M. Fragm. ix. 8*; *Reichb. Ic. Fl. Germ. t. 810, 811*.

Hab.: East coast, *R. Brown*; Port Moller, *M'Gillivray*; King's Creek, *Bowman*; Condamine River, *Leichhardt*; Brisbane River, Moreton Bay, *C. Stuart*.

Var. fluviatilis. Stem 3 to 5ft. high, acutely 3-angled. Involucre and inflorescence more developed than in the typical form. Nut equally triquetrous.—*S. fluviatilis*, A. Gray; F. v. M. *Fragm.* ix. 8. To this variety belong most of the Queensland plants.

The species extends over the tropical and temperate regions both of the New and the Old World.

14. *S. polystachyus* (many-spiked), F. v. M. in *Trans. Phil. Soc. Vict.* i. 108, and in *Hook. Kew Journ.* viii. 338; *Fragm.* ix. 9; *Benth. Fl. Austr.* vii. 335. Stems 2 to 4ft. high, more or less triquetrous. Leaves several along the stem with long sheaths, the lamina often 3 or 4 lines broad at the base, the uppermost as long as or longer than the stem. Umbel large loose and compound, of numerous rather slender rays, the longest 3 or 4in. long. Spikelets clustered on the partial rays or distinctly but shortly pedicellate, ovate-oblong, 3 to 4 lines long, and $1\frac{1}{2}$ to near 2 lines diameter. Glumes oblong or ovate, obtuse, the keel or sometimes 1 nerve on each side prominent. Hypogynous bristles about 6, very slender and flexuose, 2 or 3 times as long as the nut. Style-branches 3. Nut broad, the inner face flat, the back convex or obtusely angled.

Hab.: Southern localities, F. v. M.

15. *S. grossus* (thick), Linn. f. *Suppl.* 104. Stems 3 to 9ft. high, thick at the base. Roots fibrous, often in water or mud, often stoloniferous. Leaves often $\frac{2}{3}$ length of stem, stout, broad, keeled, edges serrate. Corymbs often 8 to 10in. in diameter, supradecomposed. Involucral bracts several, divaricate, lowest attaining 3ft., leaflike. Spikelets sessile and pedicellate, $\frac{1}{2}$ in. long, ovoid, brown, dense-flowered. Glumes ovate, obtuse with a minute mucro. Bristles 6 or fewer, in type long as nut, linear, brown, scabrid or setose by short unicellular hairs or depauperated very short smooth bristles. Stamens 3; anthers scarcely crested. Style long. Nut scarcely $\frac{1}{2}$ the glume, minutely beaked, by base of style being confluent with the nut.

Hab.: Daintree River, Pentzcke, F. v. Mueller.

6. FUIRENA, Linn.

(After G. Fuiren.)

Spikelets clustered, with several usually many hermaphrodite flowers. Glumes imbricate all round the rhachis, the lowest 1 or rarely 2 empty. Hypogynous scales 3, broad, usually 3-nerved, often alternating with small bristles. Stamens 3; anthers small. Style deciduous, with 3 stigmatic branches. Nut 3-angled. —Perennials or annuals with leafy stems. Leaf-sheaths crowned with an annular membrane. Clusters of spikelets terminal and in the upper axils, usually forming an irregular narrow terminal panicle or the clusters few and distant. Spikelets usually pubescent or hirsute.

The genus consists of but few species dispersed over the warmer regions of the New as well as the Old World, the Australian ones having both a general distribution over nearly the whole area.

Leaves glabrous. Glumes shortly pointed. Hypogynous scales contracted

at the base but sessile or nearly so, without bristles

1. *F. umbellata*.

Leaves pubescent or at least ciliate. Glume-points long, often recurved.

Hypogynous scales cordate at the base, stipitate, usually alternating with bristles

2. *F. glomerata*.

1. *F. umbellata* (umbellate), Rottb. *Descr. et. Ic. Pl.* 70, t. 19, f. 8; *Benth. Fl. Austr.* vii. 337. Perennial. Stems $1\frac{1}{2}$ to 3ft. long, 4 or 5-angled, glabrous. Leaves glabrous, the larger ones 4 to 6in. long, 4 to 5 lines broad, the lowest with long sheaths and short laminae, the upper ones passing into small floral leaves or sheathing bracts. Spikelets brown-green, usually 3 to 4 lines long, sparingly hirsute, in very dense clusters, of which 1 or 2 terminal, the others 1 or 2 together pedunculate in the upper axils. Glumes ovate, very prominently

8-nerved, produced into an erect or slightly recurved point, much shorter than in *F. glomerata*. Hypogynous scales brown, obovate, nearly $\frac{1}{2}$ line long, truncate and mucronate at the top, contracted at the base but nearly sessile without any intervening bristles. Nut rather broad, acutely triquetrous, mucronate with the slightly thickened persistent base of the style.—Kunth, Enum. ii. 185; Boeckl. in Linnæa, xxxvii. 110; R. Br. Prod. 220; F. v. M. Fragm. viii. 288.

Hab.: Endeavour River, Banks and Solander; Port Curtis, McGillivray; Rockingham Bay, Dallachy; Rockhampton, Bowman.

2. *F. glomerata* (clustered), Lam.; Kunth, Enum. ii. 184; Benth. Fl. Austr. vii. 388. Apparently annual. Stems weak, rarely above 1 ft. high. Leaves more or less pubescent or at least ciliate on the edges. Spikelets rather larger than in *F. umbellata*, either in a single terminal cluster with a leafy bract at the base, or more frequently with the addition of 1 or 2 almost sessile clusters in the upper axils. Glumes obovate, 8-nerved, produced into a rather long usually spreading or recurved point. Hypogynous scales very variable, but always distinctly stipitate and more or less cordate, usually truncate at the top and sometimes with a long terminal seta, white and thickened towards the apex or brown and membranous throughout, alternating with bristles sometimes as long as themselves, sometimes very short. Style-branches occasionally 2 only but usually 8.—Nut obovoid, acutely 3-angled.—Boeckl. in Linnæa, xxxvii. 107; R. Br. Prod. 220; F. v. M. Fragm. viii. 288; *Scirpus ciliaris*, Linn.; Rothb. Descr. et Ic. Pl. t. 17, f. 1; *F. arenosa*, R. Br. Prod. 220.

Hab.: Between Norman and Gilbert Rivers, Gulliver; Endeavour River, Banks and Solander, A. Cunningham; Keppel Bay, R. Brown; Cape York, Daemel; Rockingham Bay, Dallachy; Rockhampton and neighbourhood, Thozet, Bowman and others; Brisbane River, Moreton Bay, F. v. Mueller, Bailey; Dry-beef Creek, Leichhardt.

7. LIPOCARPHA, R. Br.

(Smooth fruited.)

Spikelets in a terminal cluster or head, with numerous hermaphrodite flowers. Glumes imbricate all round the rachis, the lowest 1 or rarely 2 empty. Hypogynous scales 2, parallel to the glume, as long as or longer than the nut and enclosing it. Stamens 1 or 2 (rarely 3?). Style deciduous, slender, with 2 or 3 stigmatic branches. Nut oblong, somewhat compressed, obtuse or crowned by a very small persistent base of the style.—Annuals or perennials, the stems leafy at the base only. Spikelets few, small, sessile. Involucral bracts leaflike narrow unequal, spreading.

A small genus spread over the tropical regions of the New and the Old World. Both the Australian species are also in the Malayan Archipelago, and one of them has a very wide tropical range.

Usually perennial, often above 1 ft., with linear leaves. Glumes spatulate or broadly cuneate, scarcely pointed. 1. *L. argentea*.

Annual, under 6 in., with filiform leaves. Glumes narrow, with spreading points 2. *L. microcephala*.

1. *L. argentea* (silvery), R. Br. App. Tuck. Congo, 40; Benth. Fl. Austr. vii. 386. Stems from a perennial rhizome attaining 1 to 1½ ft. Leaves much shorter, flat, 1 to 1½ line broad, with short open sheaths, or the inner one with a long closed sheath and short lamina. Spikelets 3 to 5, in a dense terminal head. Involucral bracts 3 or 4, spreading, the longest often 3 or 4 in. long, the others much shorter. Spikelets at first nearly globular, at length ovoid or ovoid conical, nearly white, 3 or rarely 4 lines long. Glumes very numerous, closely imbricate, spatulate or obovate-cuneate, thin and almost hyaline, rounded at the end but the broad central nerve often produced into a short point. Hypogynous hyaline

scales oblong. Stamen 1. Style-branches 8. Nut oblong, much flattened, obtuse, smooth.—Kunth, Enum. ii. 266; Boeckel. in Linnæa, xxxvii. 114; *Hypolytrum argenteum*, Vahl; F. v. M. Fragm. viii. 238.

Hab.: Brisbane River, Bailey. At one time plentiful near where the Toowong Railway Station now stands.

Widely spread over the tropical regions of the Old World.

2. *L. microcephala* (small heads), Kunth, Enum. ii. 268; Benth. Fl. Austr. vii. 337. A tufted annual, the very slender stems usually from 1 or 2 to 6 in., but sometimes nearly 1 ft. high. Leaves shorter, very narrow, with rather broad striate sheaths. Spikelets usually 3, but varying from 1 to 5 or very rarely more. Involucral bracts very narrow, the longest 1 to 2 in. long. Spikelets ovoid-conical, $1\frac{1}{2}$ to 2 lines long. Glumes very numerous, narrow, slightly cuneate, acuminate, the green keel produced into a short usually spreading point. Hypogynous hyaline scales narrow. Stamens 1 or 2. Style-branches 2. Nut oblong-linear, compressed, rather acute or almost obtuse, rather shorter than the hypogynous scales.—Boeckel. in Linnæa, xxxvii. 118; *Hypolytrum microcephalum*, R. Br. Prod. 220; F. v. M. Fragm. viii. 238; *Scirpus leptocarpus*, F. v. M. in Trans. Phil. Soc. Vict. i. 109, and in Hook. Kew. Journ. viii. 334.

Hab.: Between Norman and Gilbert Rivers, Gulliver; Brisbane River, Rockingham Bay, Dallachy; Herbert Creek, Bowman; Dry-beef Creek, Leichhardt; Rockhampton, O'Shaunessy.

8. HYPOLYTRUM, Rich.

(From *hypo*, beneath, and *clytron*, a sheath.)

Spikelets numerous, in a corymbose panicle rarely contracted into a dense cluster, with several often numerous hermaphrodite flowers. Glumes imbricate all round the rhachis, several of the lower ones smaller and empty. Flowers flat. Hypogynous scales (bracteoles?) 2, placed right and left, complicate, the keel acute usually ciliate, no inner flat ones. Stamens 3 or fewer. Style slender, deciduous, stigmatic branches 2 or 3, filiform. Nut hard, obtusely 3-angled or compressed, smooth or irregularly wrinkled.—Usually coarse perennial plants with leafy stems. Panicles compound, with long leafy involucral bracts. Spikelets small.

The genus comprises but few species dispersed over the tropical and subtropical regions of the New and the Old World, the Australian species having a very wide general range.

1. *H. latifolium* (broad-leaved), Rich; Kunth, Enum. ii. 271; Benth. Fl. Austr. vii. 339. Stems acutely 3-angled, 2 to 4 ft. high. Leaves usually longer, $\frac{1}{2}$ to 1 in. broad, with 8 prominent nerves and more or less scabrous on the margins and midrib. Panicle densely corymbose, 3 to 4 in. diameter, with 2 to 4 long leafy involucral bracts. Spikelets very numerous, oblong-cylindrical at first, ovoid when in fruit, 2 to 3 lines long. Glumes numerous, broadly ovate, obtuse or scarcely mucronate, the midrib slightly prominent, otherwise nerveless, 3 or 4 of the lower ones empty and more acute. Hypogynous scales or bracteoles prominently keeled when in flower, opened out and nearly flat under the fruit, shorter than the glume. Stamens 2. Style-branches 2 (or 3?). Nut when fully ripe nearly globular, slightly compressed, rather longer than the glume, very obtuse and smooth, in some specimens narrower conical at the top and somewhat rugose but perhaps not ripe.—F. v. M. Fragm. viii. 238; *H. giganteum*, Wall.; Bot. Mag. t. 6282; Boeckel. in Linnæa, xxxvii. 131.

Hab.: Rockingham Bay, Dallachy; Daintree River, Fitzalan. Common in tropical Asia and Africa.

9. MAPANIA, Aubl.

(*Pandanophyllum*, Hassk. *Thoracostachyum*, Kunz).

Spikelets solitary clustered or paniculate, with numerous hermaphrodite flowers. Glumes imbricate all round the rhachis, a few of the lowest empty. Flowers flattened. Hypogynous scales 6, 2 outer ones (bracteoles?) placed right

and left, complicate, the keel acute, usually ciliate; 4 inner ones flat or concave, narrow, thin, often several-nerved but without any prominent midrib, one next the glume, the 8 others alternating with the stamens. Stamens usually 3; 2 lateral and 1 next the glume. Style slender, glabrous, deciduous; stigmatic branches 3, filiform. Nut sessile, triquetrous or flattened.—Stout perennial plants usually with long broad leaves. Stems leafless or leafy at the base only, sometimes scape-like with a single large spikelet or head of spikelets and small involucre bracts, sometimes with a terminal head, corymb or panicle of few or numerous spikelets and long or large leafy involucre bracts. Spikelets usually large.

The genus is now known to contain a considerable number of species from the tropical regions of America, Africa and Asia, extending to the South Pacific Islands.

1. **M. hypolytroides** (Hypolytrum-like), *F. v. M. Benth. Fl. Austr.* vii. 341. Stems stout, 8-angled. Leaves 4ft. long, 1 to 2in. broad, with scabrous edges. Panicle dense, very compound, 6 to 10in. diameter. One or two of the lower involucre bracts 1 or 2ft. long and $\frac{1}{2}$ to 1in. broad, tapering into long points. Spikelets very numerous, shortly pedicellate, said to be white when fresh, light brown when dry, ovoid, 3 to 4 lines long, about 2 lines diameter. Glumes closely imbricate, ovate or oblong, obtuse, thin, with only a very slender central nerve especially on the outer ones, 3 or 4 of the lowest smaller and empty. Hypogynous scales all narrow, thin and rather shorter than the glume, the 2 outer ones (or bracteoles) with ciliate keels, the 4 inner ones glabrous. Style-branches 3. Young nut triquetrous, but not seen full grown.—*Hypolytrum pandanophyllum*, *F. v. M. Fragm.* ix. 16.

Hab.: Rockingham Bay, *Dallachy*.

10. SCIRPODENDRON, Kurz.

(Tree-*Scirpus*.)

Spikelets in dense clusters, with numerous hermaphrodite flowers. Glumes imbricate all round the axis, a few of the lower ones empty. Flowers flattened. Hypogynous scales several, 2 outer ones (bracteoles?) placed right and left, complicate, the keel acute, usually ciliate, the inner ones flat or concave without any prominent midrib. Stamens 6 (or more?). Style slender, glabrous, with 3 or 2 short filiform branches. Nut large, woody, with very prominent longitudinal ribs.—Stout plant with long broad leaves. Stems leafless or leafy at the base only. Clusters of spikelets in a dense thyrsoid panicle with long leafy involucre bracts.

The genus is limited to a single species dispersed over the Malayan Archipelago and apparently also in Ceylon and the Samoa Islands. It is closely allied to *Mapania* and *Lepironia*, differing from both in the nut, the largest known in the Order.

1. **S. costatum** (ribbed), Kurz in *Journ. Asiat. Soc. Beng.* xxxviii. 85; *Benth. Fl. Austr.* vii. 341. Stems from a thick woody rhizome stout, 8-angled, 1 to 2ft. high. Leaves 6 to 9ft. long, 1in. broad or more, 8-nerved, with scabrous margins. Clusters of spikelets sessile or nearly so, in a dense oblong-thyrsoid panicle, the lower leafy involucre bracts 1 to 2ft. long. Spikelets ovoid, 4 to 5 lines long, 2 to 3 lines diameter. Glumes closely imbricate, very broad and thin, many-nerved and readily splitting into as many shreds. Scales as long, apparently more than 6 besides the 2 outer complicate ones or bracteoles but splitting so readily that it is difficult to ascertain their number. Stamens 6 or sometimes 7; anthers very long. Nut ovoid conical or nearly globular, 4 to 6 lines diameter, with 6 to 10 very prominent thick longitudinal ribs, the apex truncate or convex in some specimens, conical in others.—*S. sulcatum*, Kurz (by a clerical mistake?) *Miq. Ill. Fl. Archip. Ind.* 65. t. 28; *Hypolytrum costatum*, *Thw. Enum. Pl. Zeyl.* 346, according to Kurz.

Hab.: Daintree River, *Fitzalan*.

11. EXOCARYA, Benth.

(Nut exerted.)

Spikelets small, umbellate-paniculate, with 1 or 2 hermaphrodite flowers and 2 or 3 male ones below them. Glumes imbricate all round, several lower ones empty. Flowers flattened. Hypogynous scales 4, 2 outer ones (bracteoles?) placed right and left, complicate, keeled, 2 inner flat or concave, parallel with the glume. Stamens 3. Style dilated at the base into a hard bulb, with 2 linear stigmatic branches. Nut exerted, crowned by the persistent bulb of the style.—Stem leafy. Umbel compound, the general and partial rays slender with a central sessile spikelet as in *Fimbriatylis*.

The genus is limited to the single species, endemic in Australia.

1. *E. scleroides* (Scleria-like), Benth. in Hook. Ic. Pl. t. 1206; Fl. Austr. vii. 389. Stems from a creeping rhizome 2ft. high or more but slender and weak, 8-angled, leafy throughout. Leaves grass-like, long and flat, 1 to 2 lines broad, tapering into long subulate points, the sheaths close. Umbel large and slender, very compound, the longest rays 4 to 6in. long, filiform as well as the pedicels. Involucral bracts several, like the leaves, but the longest scarcely so long as the inflorescence. Spikelets 1 to 1½ line long, narrow-oblong, dark brown. About 6 empty glumes all obtuse, the outer ones very short, the inner gradually passing into the longer flowering ones. Male flowers usually about 8, and 1 rarely 2 hermaphrodite flowers in some spikelets. Hypogynous scales as long as the glume, the 2 outer complicate ones with shortly ciliate keels, the two inner ones parallel to the glume and flat or concave. Stamens 3. Style-bulb black, larger than the ovary at the time of flowering but not enlarged afterwards. Nut quite exerted, erect, ovoid-oblong, very obtuse, about 2 lines long and 1½ line diameter, smooth but not shining, the remains of the spikelet forming a small tuft at its base.—*Cladium scleroides*, F. v. M. Fragm. ix. 12; *Scleria ustulata*, Bail. 3rd. Suppl. Syn. Ql. Fl.

Hab.: Dawson and Burnett Rivers, Leichhardt; summit of Bellenden Ker, Bailey; towards Tweed River, Thos. Steel.

In technical characters this elegant plant approaches very nearly to *Mapania*, and is, as it were, intermediate between that genus and *Hypolytrum*. but the inflorescence, the minute spikelets and the exerted nuts larger than the whole spikelet give it a very different aspect from any species of either genus.—Benth.

12. LEPIRONIA, Rich.

(Chondrachne, R. Br.)

Spikelet solitary, lateral, with numerous hermaphrodite flowers. Glumes closely imbricate all round the rhachis, concealing the floral scales, a few of the lowest empty. Flowers flat. Hypogynous scales numerous, 2 outer ones (bracteoles?) placed right and left, complicate, the keel ciliate, the others narrow, flat or nearly so, closely packed in several rows. Stamens 6 or more, alternating with the inner or opposite the outer scales. Style central, with 2 filiform stigmatic branches. Nut flat, not ribbed.—Stems from a creeping rhizome rush-like, transversely septate inside, leafless except sheathing scales. Spikelet oblique at the base of a terete involucral bract continuing the stem.

The genus is limited to the single Australian species, which extends over the Malayan Archipelago, parts of East India and Madagascar.

1. *L. mucronata* (pointed), Rich. in Pers. Syn. i. 70; Benth. Fl. Austr. vii. 342. Rhizome creeping. Stems 2 to 3ft. high, varying from 1 to 3 lines in thickness, rigid, terete, marked by internal transverse septa giving it an articulate appearance, enclosed at the base by a few long loose sheathing scales, otherwise leafless. Spikelet apparently lateral, in the axil of an erect terete involucral

bract strictly continuous with the stem and not dilated at the base, the spikelet varying from shortly ovoid or almost globular and $\frac{1}{2}$ in. long to oblong-fusiform and above $1\frac{1}{2}$ in. long, from rather pale brown to almost black and shining. Glumes exceedingly numerous, very closely imbricate in spiral rows, broad almost orbicular, obtuse, membranous or rigid, completely concealing the floral scales, 8, 4 or sometimes more of the lower ones empty and shorter. Flowers very flat, the anthers and style-branches only shortly protruding from under the glumes. Hypogynous scales usually about 16 (said to be 8 only in some extra-Australian specimens), the two outer complicate ones or bracteoles with a ciliate keel, the others linear or oblong-linear, shorter than the glume. Stamens 8 or more, alternating with the inner scales or opposite the outer ones, apparently variable in number. Style glabrous. Nut flat, broadly ovate or almost orbicular, rounded at the end or almost acute, smooth or nearly so, without the longitudinal ribs of *Chorisandra*.—Kunth, Enum. ii. 366; Miq. Ill. Fl. Austral. Ind. t. 20; F. v. M. Fragm. ix. 17; *Chondrachne articulata*, R. Br. Prod. 220.

Hab.: East coast, R. Brown; Moreton Bay and environs, M-Gillcray, F. v. Mueller, Leichhardt, Bailey.

18. CHORISANDRA, R. Br.

(The sexes sometimes separated.)

Spikelets (or heads) solitary, lateral, with numerous hermaphrodite flowers (or androgynous spikelets). Glumes loosely imbricate all round the rhachis, not longer than the floral scales, a few of the lowest empty. Flowers flat or terete. Hypogynous scales numerous, the 2 outer ones (bracteoles?) placed right and left, complicate, the keel ciliate, the others narrow, flat or nearly so and closely packed in several rows or all spatulate or oblong and flat or concave. Stamens 6 to 12 or more, alternating with the inner or opposite the outer scales. Style central, deeply divided into 2 stigmatic branches. Nut biconvex or ovoid-globular, with about 8 prominent longitudinal ribs.—Stems from a creeping-rhizome rush-like, transversely septate inside or continuous. Leaves few at the base of the stem, long terete and stem-like, or all reduced to sheathing scales. Spikelet globular or ovoid.

The genus is endemic in Australia with the exception of one species which extends to New Caledonia.

SECT. I. *Euchorisandra*.—Spikelet globular, sessile, the base of the involucrel bract not at all or scarcely dilated. Two outer hypogynous scales complicate and keeled.

Stems transversely septate. Glumes acuminate-acute almost aristate . . . 1. *C. sphaerocephala*.

SECT. II. *Cymbaria*.—Spikelet ovoid-globular, half-immersed in the dilated base of the involucrel bract. Hypogynous scales all oblong-spatulate and slightly concave.

Stems transversely septate. Glumes obtuse 2. *C. cymbaria*.

1. *C. sphaerocephala* (globose-headed), R. Br. Prod. 221; Benth Fl. Austr. vii. 314. Stems from a short rhizome $1\frac{1}{2}$ to 2 ft. high or more, marked inside by transverse septa giving it an articulate appearance. Leaves few, erect, rigid and stem-like, shorter than the stem, with long open sheaths. Bract terminating the stem and continuous with it, without any basal dilatation. Spikelet globose, sessile, 4 to 5 lines diameter when fully out, almost black. Glumes very numerous, a few outer empty ones short broad and obtuse, the flowering ones lanceolate or ovate-lanceolate, acute and mostly aristate with short fine points giving the spikelet an echinate or hirsute aspect. Flowers flat, Hypogynous scales nearly as long as the glumes, 2 outer ones complicate with acute ciliate keels, the other 12 to 16 somewhat spatulate at the base, very dark at the end, acuminate almost aristate, not keeled but the margins slightly ciliate. Stamens few, alternating with the inner scales. Nut broadly ovate, biconvex, with about 8 very prominent longitudinal ribs.—Boeckl. in Linnaea, xxxvii. 142; F. v. M. Fragm. ix. 18.

Hab.: Islands of Moreton Bay and other southern localities.

2. *C. cymbaria* (boat-shaped), *R. Br. Prod.* 221; *Benth. Fl. Austr.* vii. 845. Stems from a thick creeping rhizome 2 to 3 ft. high or even more, rigid, rush-like, more or less distinctly marked with transverse septa. Leaves few, erect, terete, and stem-like, often longer than the stem, with long loose open sheaths or the lower ones reduced to sheathing scales. Spikelet ovoid or nearly globular, erect but half emersed in the dilated base of the erect involucre bract so as to appear adnate. Glumes very broad, obtuse, membranous. Flowers not flattened. Hypogynous scales about 15, rather longer than the glumes, imbricate, oblong-spathulate in the upper part, dark-coloured, somewhat concave, denticulate or jagged. Stamens about 12, alternating with the inner scales (or opposite the outer ones). Nut obovoid-globular, $1\frac{1}{2}$ line diameter, with about 8 very prominent longitudinal ribs.—*F. v. M. Fragm.* ix. 18.

Hab.: Brisbane River, Moreton Bay, *F. v. Mueller*, *Leichhardt*, *Bailey*; and other southern localities.

14. REMIREA, Aubl.

(Its name in Guiana.)

Spikelets small, densely capitate, with a single terminal hermaphrodite flower. Glumes 4, the 2 outer ones imbricate, the third larger, membranous, enveloping the fourth which is thick and fleshy, enclosing the flower. No hypogynous scales or bristles. Stamens 3. Style continuous with the ovary, not thickened at the base, deciduous; stigmatic branches usually 3, filiform. Nut closely enveloped in the inner 2 glumes, ovoid-triangular, often slightly compressed.—Low branching perennial. Leaves linear, with short imbricate sheathing bases. Spikelets very numerous, in ovoid sessile spikes solitary or clustered and surrounded by leafy involucre bracts.

The genus is limited to the single Australian species, which is dispersed along the sandy sea-coasts of most tropical countries.

1. *R. maritima* (a sea-side plant), *Aubl. Pl. Gui.* i. 45, t. 16, var. *pedunculata*; *Benth. Fl. Austr.* vii. 847. Stems from a creeping and rooting base ascending or erect, much branched, a few in. high, completely covered with the imbricate bases of the leaves in the typical form, produced into a peduncle in this variety. Leaves rigid, 1 to 3 in. long, $1\frac{1}{2}$ to 3 lines broad at the base, tapering into a point often pungent, dilated at the base into a short open sheath. Spikes ovoid, 4 to 6 lines long, solitary or more frequently several together sessile in a terminal head or cluster surrounded by 3 to 6 involucre bracts, the longest 1 to 2 in. long. Spikelets very numerous, terete, usually about 2 lines long subtended by a glume-like bract. Lower glume short, the second longer, both broad and appressed but open longitudinally, the third 2 lines long, membranous, very broad but closely wrapped round the fourth or flowering glume, which is shorter and much thickened, becoming harder round the ripe nut.—*Bœckl. in Linnaea*, xxxv. 485; *R. pedunculata*, *R. Br. Prod.* 236, *Kunth, Enum.* ii. 189; *F. v. M. Fragm.* ix. 20.

Hab.: Abundant on the sandy sea-shores of the eastern coast, *R. Brown*, *A. Cunningham*, *Dallachy*; and many others.

In the typical American specimens, as in the majority of the African and some of the East Indian ones, the branches are leafy almost or quite up to the involucre bracts.

15. ARTHROSTYLES, R. Br.

(Referring to the style being articulated.)

Spikelets with a single hermaphrodite flower or rarely with a second male flower. Glumes several, all but the uppermost 1 or 2 empty imbricate all round the rachis. Hypogynous bristles none. Stamens or staminodia 6, filaments 3 short with perfect anthers, 3 much longer with very deciduous (or without?).

anthers. Style hairy, thickened at the base, articulate and falling off below the thickening; stigmatic branches 3, recurved, densely cottony-woolly. Nut ovoid-globular, obscurely 3-angled, very obtuse.—Perennial, leafless except the sheathing scales at the base. Spikelets in a small terminal head.

The genus as above characterised is limited to the single Australian species.

1. *A. aphylla* (leafless), *R. Br. Prod.* 229, not of *Beckel*; *Benth. Fl. Austr.* vii. 423. Stems from a short thick rhizome erect, more or less tufted, rigid, more or less flattened, from very slender to about 1 line broad, 1 to 1½ ft. high, the sheathing scales at the base more or less hairy, thin and scarious at the top, the old ones dark brown and persistent round the base of the flowering stems after their own stems have perished. Terminal head of spikelets depressed-globular or hemispherical, 3 to 4 lines diameter. Outer bracts lanceolate-acuminate or almost subulate, 1 or 2 often nearly as long as the head, the others subtending the spikelets gradually passing into the glumes. Spikelets numerous and sessile in the head, 1½ to nearly 2 lines long. Glumes about 7, the innermost flowering one oblong-lanceolate, acute, membranous, obscurely 3 or 5-nerved, the others gradually shorter and broader, all empty in the spikelets examined, but according to *Beckeler* there is sometimes a second male flower. Anthers of the longer stamens when present exerted, those of the shorter ones included. Style-branches recurved and very conspicuous from their white pubescence. Nut whitish, smooth or under a strong lens minutely reticulate.—*Fimbristylis aphylla*, *F. v. M. Fragm.* ix. 9, as to the Australian plant; *F. paniculmis*, *Beckel. in Linnæa*, xxxviii. 891; *Hook. Ic.* 1845.

Hab: Endeavour River, *Banks and Solander*.

In most cases, by the time the style-branches are well out, the longer filaments are without anthers, but in the bud I have generally seen one at least; and once all three present.—*Benth.*

16. RHYNCHOSPORA, Vahl.

(Referring to the seed being beaked.)

(*Cephaloschomus* and *Morisia*, *Nees*.)

Spikelets capitate or paniculate, with 1 or 2 hermaphrodite flowers and often 1 or 2 males, oblong, more or less acuminate. Glumes imbricate all round the rachis; 3, 4 or more outer ones shorter and empty, and 1 or 2 above the flowering ones enclosing male flowers or empty. Hypogynous bristles 6, rarely fewer, sometimes more. Stamens 8 or fewer. Style slender, conically dilated at the base; stigmatic branches 2. Nut globular or more or less flattened, crowned by the persistent conical or elongated base of the style, which is sessile and continuous or separated by a constriction but not distinctly articulate.—Stems simple under the inflorescence, usually leafy. Spikelets usually of a rich brown, more or less clustered, in terminal or axillary heads or corymbs sometimes forming large terminal panicles.

The genus is widely spread over the tropical and temperate regions of the New and the Old World.

Spikelets clustered in a compound panicle, the partial panicles corymbose or cymose.

Spikelets 3 to 4 lines long, very numerous, the terminal corymb 3 to 4 in. diameter. Beak of the nut long and thick, usually furrowed

1. *R. aurea*.

Spikelets 2 to 3 lines long, in loose corymbs of ½ to 1 in. diameter.

Beak of the nut not longer than the nut and closely sessile

2. *R. glauca*.

Spikelets in a single dense terminal head.

Hypogynous bristles shorter than the nut. Nut smooth, broadly obovoid, with a very short beak. Stem usually above 1 ft.

3. *R. Wallichiana*.

Three at least of the bristles much longer than the nut. Nut oblong.

Stem usually under 1ft.

Spikelets 4 to 5 lines long. Not tuberculate or hispid, the beak closely sessile and often as long as the nut. Leaves shorter than the stem

4. *R. longisetis*.

Spikelets about 3 lines. Nut smooth or nearly so, the beak short and constricted at the base. Leaves often as long as the stem

5. *R. tenuifolia*.

1. ***R. aurea*** (golden), *Vahl*; *Kunth, Enum. ii.* 293; *Benth. Fl. Austr. vii.* 348. Stems 2 to 3ft. high, 8-angled, leafy throughout. Leaf-sheaths terminating in a short broad membranous ligula, the blade long, pointed, with scabrous edges. Spikelets very numerous, clustered in more or less corymbose panicles almost shortened into compound umbels, usually one large terminal one 3 to 4in. diameter and 1 to 3 smaller axillary ones lower down the stem. Floral leaves or bracts usually longer than the inflorescence. Spikelets 3 to 4 lines long, with 1 perfect flower and 1 or 2 males. Hypogynous bristles 6, usually longer than the nut but scarcely so long as the beak. Nut obovate, often scabrous, especially in the centre of each side, the beak sessile, as long as the beak or longer and as broad as the base, usually but perhaps not always furrowed on each side.—*Boeckel. in Linnæa, xxxvii.* 626; *R. Br. Prod.* 230; *F. v. M. Fragm. ix.* 17.

Hab.: Endeavour River, *Banks and Solander*; Rockingham Bay, *Dallachy*; Brisbane River, *Bailey*.

Widely spread over the tropical regions of the New and the Old World.

2. ***R. glauca*** (grey), *Vahl*; *Kunth, Enum. ii.* 297; *Benth. Fl. Austr. vii.* 349. Stems angular and 1 to 2ft. high or even more but slender. Leaves few, narrow and distant, the radical ones sometimes as long as the stem. Spikelets not very numerous, clustered in small loose irregular corymbs $\frac{1}{2}$ to nearly lin. diameter, the terminal one more compound, with several small distant ones shortly pedunculate in the upper axils. Spikelets 2 to 3 lines long, with 1 or 2 hermaphrodite and 1 or 2 male flowers. Outer empty glumes 3 or 4, short. Hypogynous bristles 6 or 7, mostly rather longer than the nut. Nut obovate, marked with minute transverse wrinkles, the beak conical shorter than or nearly as long as the nut, sessile, not furrowed.—*Boeckel. in Linnæa, xxxvii.* 585; *F. v. M. Fragm. ix.* 17; *R. laxa, R. Br. Prod.* 230; *Kunth, l.c.* 298; *R. Brownii, Röm. et Schult. Syst. ii.* 86; *Boeckel, l.c.* 581.

Hab.: Endeavour River, *Banks and Solander*; Brisbane River, *Moreton Bay, F. v. Mueller*.

Extends over the tropical and subtropical regions of the New and the Old World.

3. ***R. Wallichiana*** (after Dr. N. Wallich), *Kunth, Enum. ii.* 289; *Benth. Fl. Austr. vii.* 849. Stems 1 to 2ft. high, leafy at the base only. Leaves narrow, nearly as long as the stem or much shorter, the outer ones with open sheaths not ciliate, the inner one with a long close sheath. Spikelets numerous in a dense globular head. Involucral bracts spreading, the longest 2 to 3in. long. Spikelets brown, $2\frac{1}{2}$ to 3 lines long, with 1 hermaphrodite and often 2 male flowers, and 3 or 4 outer empty glumes. Hypogynous bristles not so long as the nut and sometimes very short. Nut obovate-orbicular, smooth, the beak scarcely one-third of its length.—*Boeckel. in Linnæa, xxxvii.* 542; *F. v. M. Fragm. ix.* 17; *Morisia Wallachti, Nees; Hook. f. Fl. Tasm. Præf.* 48.

Hab.: Rockingham Bay, *Dallachy*; Wide Bay, *Bidwill*; Brisbane River, *Bailey*.

Extends over tropical Asia and Africa.

4. ***R. longisetis*** (bristles long), *R. Br. Prod.* 230; *Benth. Fl. Austr. vii.* 350. Stems 6in. to 1ft. high. Leaves shorter, mostly at the base of the stem, narrow, with loose open ciliate sheaths, the inner one or two with close sheaths reaching sometimes halfway up the stem. Spikelets numerous, in a dense terminal globular head. Involucral bracts spreading or reflexed, the longest 2 to 4in. long, linear, subulate-acuminate, dilated and ciliate at the base. Spikelets

4 to 5 lines long, acuminate, of a pale shining brown, 8 or 4 of the outer glumes shorter and empty. Hypogynous bristles 3 much longer than the nut and often as long as the glume, 3 or 2 much shorter. Nut oblong, biconvex, more or less tuberculate, the beak as long as or rather shorter than the nut and closely sessile upon it by its broad base.—Kunth, Enum. ii. 289; Boeckl. in *Linnaea*, xxxvii. 541; *R. pterochata*, F. v. M. *Fragm.* ix. 17.

Hab.: Gulf of Carpentaria; between Norman and Gilbert Rivers, *Gulliver*; Rockingham Bay, *Dallachy*.

5. *R. tenuifolia* (leaves slender), *Benth. Fl. Austr.* vii. 350. Very near *R. longisetis*, but with smaller spikelets and a different fruit. Stems slender, 6 to 8 in. high. Leaves numerous, very narrow, and often longer than the stem, the outer ones with open sheaths scarcely ciliate, the inner sheaths longer and more closed. Inflorescence and involucre bracts as in *R. longisetis*, but, the spikelets scarcely above 3 lines long when fully out. Hypogynous bristles 3, nearly as long as the glume, 8 scarcely longer than the nut. Nut oblong, slightly biconvex, bordered by a nerve-like margin, smooth or scarcely tuberculate, the beak not half so long and abruptly contracted at the base so as to appear stipitate.—*R. longisetis*, F. v. M. *Fragm.* ix. 17, not of R. Br.

Hab.: Rockingham Bay, *Dallachy*.

17. MESOMELÆNA, Nees.

(Middle of the base of the bract dark.)

(*Gymnoschoenus*, Nees.)

Spikelets numerous in a dense head enclosed within the sheaths of the involucre bracts, with 2 flowers, the upper one fertile, the lower sterile or male (or 1 only, the lower one deficient in *M. deusta*), the rhachis short. Glumes distichous or nearly so, 2 to 4 outer ones empty, the flowering ones closely enveloping the flowers. Hypogynous bristles or scales 3, often flat. Stamens 3. Style thickened and rigid in the lower part but at length usually deciduous; stigmatic branches 3. Nut obovoid, crowned when young by the hardened base of the style, inserted on a raised torus or a short thick stipes.—Densely tufted rigid perennials. Leaves at the base of the stem only, often long, or rarely 1 on the stem. Flower-head solitary and terminal, the enclosing bracts broad and rigid often black, 1 usually and sometimes 2 or more with linear points or laminae.

The genus is limited to Australia. It is well characterised by the inflorescence as well as by the hypogynous bristles or scales constantly 3 only and all equal.

Flower-heads above $\frac{1}{2}$ in. Leafy points of the bracts erect. Spikelet

6 to 8 lines

1. *M. deusta*.

Flower-heads globular, very compound. Spikelets 2 to 3 lines long.

Outer-bracts orbicular or very broad, with short or without points 2. *M. sphaerocephala*.

1. *M. deusta* (burnt), *Benth. Fl. Austr.* vii. 379. Stems densely tufted on a horizontal rhizome, rigid, 6 in. to 1 ft. high. Leaves much shorter, all radical with open sheaths or one embracing the stem with a longer close sheath. Flower-head ovoid or turbinate, $\frac{1}{2}$ to $\frac{3}{4}$ in. long; outer bracts 2, erect, the sheaths as long as the spikelets, black and rigid with scarious hyaline margins, and erect leafy points, $\frac{1}{2}$ to 1 in. long on the outer bract, shorter on the second, the bracts within the head more glume-like. Spikelets numerous, sessile, 6 to 8 lines long, very narrow, 1-flowered, dark-coloured. Glumes not strictly distichous, 4 to 5 empty ones nearly of the same length, the pubescent keels ending in short points, rather longer and more obtuse on the outer ones, the inner ones with membranous sides, the flowering glume thin and hyaline, and above the flower an empty glume more like the outer ones but smaller. Hypogynous bristles 3, nearly as long as the glumes, ciliate in the lower part. Stamens 3. Style long, rigid at the base.

Ovary oblong, tapering into the continuous style. Nut angular, about 2 lines long.—*Carpha deusta*, R. Br. Prod. 230; Boeckel. in Linnæa, xxxviii. 269; *Chatospora deusta*, F. v. M. Fragm. ix. 39; *Rhynchospora deusta*, Spreng. Syst. i. 195; *Desvauxia aristata*, Nees. in Sieb. Agrostoth. n. 25.

Hab.: Brisbane River and many other southern localities.

2. *M. sphaerocephala* (round-headed), Benth. Fl. Austr. vii. 380. Stems in large tufts 3 to 5 ft. high, slender but rigid, usually compressed or 3-angled under the inflorescence. Leaves at the base of the stem, long, rigid, flat or concave, rarely above 1 line broad, but dilated at the base into open brown sheaths fringed with long woolly hairs. Flower-heads very compound and dense, globular, about $\frac{1}{2}$ in. diameter. Involucral bracts very broadly ovate or orbicular, as long as or rather longer than the spikelets; one outer one tapering to an obtuse point usually very short but sometimes longer and leaflike, all the others very broad and obtuse, and several similar bracts prominent within the head. Spikelets very numerous, somewhat compressed, 2 to 3 lines long. Flowers 2 close together, the outer one male the upper hermaphrodite. Glumes obscurely distichous, 4 or 5 outer ones very broad and obtuse gradually shorter, flowering glumes nearly twice as long, broad and completely enveloping each other, the outer one rigid, the inner more membranous. Hypogynous bristles 3, short and slender. Stamens 3. Style-branches 3. Nut obovoid, seated on a raised torus or thick stipes, crowned by the narrow pubescent base of the style.—*Chatospora sphaerocephala*, R. Br. Prod. 233; Boeckel. in Linnæa, xxxviii. 299; F. v. M. Fragm. ix. 33; *Gymnoschanus sphaerocephalus*, Hook. f. Fl. Tasm. ii. 83, t. 142; *Xyris laevis*, Nees in Sieb. Pl. Nov. Holl. n. 204; *Gymnoschanus adustus*, Nees in Ann. Nat. Hist. ser. i. vi. 47.

Hab.: Northern border of N.S.W., near Wallangarra.

18. SCHÆNUS, Linn.

(From cord having been made from these plants.)

(*Chatospora*, R. Br.; *Isoschanus* and *Helothrix*, Nees; *Gymnochæta*, Steud.)

Spikelets variously capitate paniculate or solitary, with 2 or more (rarely 6) flowers, all hermaphrodite and fertile or the uppermost sterile. Glumes distichous, several outer ones or sometimes only 2 or 1 empty, the rhachis very short and straight between the empty glumes, more or less elongated and curved between the flowering glumes and flexuose, the flowers seated in the alternate notches, and the rhachis shortly produced above the last flower bearing a small empty glume. Hypogynous bristles or sometimes scales 6, or few and unequal, or none, often ciliate at or near the base, rarely much longer than the nut. Stamens 3 or very rarely 4 to 6 or only 1. Style slender or rarely slightly thickened towards the base, deciduous; stigmatic branches 3, filiform, sometimes almost plumose. Nut obovoid, ovoid or rarely oblong or globular, more or less distinctly 3-angled or 3-ribbed, smooth reticulate foveolate or tuberculate.—Usually perennials, the stems often rigid and leafless below the inflorescence. Leaves either radical or at the base of the stem, narrow or subulate or reduced to the brown sheaths, or in a few species the stem leafy, either tall and rigid or short and weak or filiform and floating. Spikelets when capitate in sessile clusters within the head, the clusters and spikelets subtended by glume-like bracts, and the outer bracts of the head forming an involucre with or without leaflike laminae; when paniculate the peduncles spikelets or branches of the panicle clustered within sheathing bracts, with or without leaflike laminae, the lower ones usually distant. Glumes frequently dark-coloured or black.

The genus is almost limited to the Old World and is chiefly Australian, but represented by a few species in the temperate regions of the northern hemisphere, in extra-tropical South America, in South Africa, New Zealand, and in the Malayan Archipelago.

SERIES I. *Isoschoenese*.—Spikelets in a single terminal head but either few in the head or sometimes only 2 or 3, or if numerous spreading or the head loose. Hypogynous bristles none.

Spikelets 3 lines. Involucral bracts short or only 1 exceeding the head.

Leaf-sheaths bearded, the subulate points short. Stamens 3 . . . 1. *S. ericetorum*.

SERIES II. *Laterales*.—Spikelets not above 2 lines long, in a single lateral head or cluster or rarely solitary, the erect involucral bract continuing the stem. Hypogynous bristles ciliate.

Leaf-sheaths not bearded. Spikelets brown. Glumes obtuse. Bristles

longer than the nut . . . 2. *S. nitens*.

SERIES III. *Calostachyæ*.—Spikelets large, pedunculate in distant sheaths, solitary or very few in each sheath. Outer empty glumes numerous, regularly distichous. Stamens 5.

Spikelets 1 lin. Glumes acute. Hypogynous bristles present. Sheathing bracts with leafless laminae

3. *S. calostachyus*.

Spikelets $\frac{3}{4}$ to 1 lin. Glumes obtuse with gland-like tips. Outer empty ones 5 or 6. No hypogynous bristles. Sheathing bracts with very short obtuse points. Peduncles scabrous

4. *S. scabripes*.

SERIES IV. *Paniculatæ*.—Spikelets under $\frac{1}{2}$ in. long, usually dark-brown or black, often falcate, all pedunculate, either numerous in a panicle usually secund or rarely few in a terminal cluster.

Panicle or cluster short and dense. Stems rush-like. Leaf-sheaths at the base only with very short points, not bearded. Spikelets numerous, about 5 lines. No hypogynous bristles

5. *S. brevifolius*.

Panicle loose but narrow. Leaf-sheaths bearded, with short or subulate points. Hypogynous bristles none or fine and rare.

No leaf-sheaths between the basal and floral ones. Spikelets black, flat, 3 to 4 lines. Nut granular, tuberculate

6. *S. melanostachyus*.

Leaf-sheaths few on the stem, with short subulate points. Spikelets brown, acute, scarcely flattened, 4 lines. Nut smooth

7. *S. sparteus*.

Leaf-sheaths several, distant, with linear laminae. Spikelets brown, scarcely flattened, about 5 lines

8. *S. vaginatus*.

Panicle loose and much branched with very numerous spikelets. Stem leafy, the lower leaves very long. No hypogynous bristles.

Leaves nearly 2 lines broad at the base, tapering into long points.

Spikelets 4 to 6 lines . . . 9. *S. falcatus*.

Leaves subulate from the base. Spikelets 2 lines . . . 10. *S. punctatus*.

SERIES V. *Laxæ*.—Spikelets under $\frac{1}{2}$ in. long, few on slender pedicels. Hypogynous bristles present. Leaves at the base of the stem very narrow or subulate.

Stems loosely hairy in the lower part. Spikelets dark-brown, about 3 lines long

11. *S. indutus*.

SERIES VI. *Microcarpæ*.—Spikelets small in a terminal loose cluster or irregular umbel or clustered in the axils of distant leafy bracts. Nuts very small and white. Small or slender and weak plants with flaccid leaves.

Spikelets black, in a terminal cluster or irregular umbel, with few axillary clusters lower down.

Hypogynous bristles present. Nut smooth or nearly so . . . 12. *S. Brownii*.

No hypogynous bristles. Nut smooth . . . 1. *S. ericetorum*.

1. ***S. ericetorum*** (found in heath-country), *R. Br. Prod.* 281; *Benth. Fl. Austr.* vii. 362. Stems slender, densely tufted, 6 in. to above 1 ft. high. Leafless except brown sheathing scales at the base which are bearded at the orifice with short woolly hairs. Flower heads rather loose, sometimes forming a small corymb, with 1 or 2 lateral clusters on peduncles of 2 or 3 lines, but often quite compact. Spikelets black, lanceolate, fully 8 lines long, curved and acuminate, with 2 flowers. Glumes often numerous, 6 or 7 outer ones empty. No hypogynous bristles. Stamens 3. Nut obovoid, very obtuse or retuse, obtusely 3-angled, but scarcely ribbed, rugose.—*Sieb. Agrostoth.* n. 45; *F. v. M. Fragma.* ix. 28; *Bœckel in Linnæa*, xxxviii. 278.

Hab.: Burleigh Heads, *Rev. B. Scortechini*; and southern localities.

2. **S. nitens** (shining), Hook. f. *Handb. N. Zeal. Fl.* 299; Benth. *Fl. Austr.* vii. 362. Stems from a creeping rhizome, slender, from an inch or two to 1 ft. high. Leaves few at the base of the stem, short, terete but furrowed along the inner side, the sheaths not bearded. Involucral bract erect, continuing the stem to $\frac{1}{2}$ to $1\frac{1}{2}$ in. beyond the inflorescence. Spikelets in a sessile cluster of 2 to 6 or solitary, apparently lateral, from ovoid to ovoid-lanceolate, $1\frac{1}{2}$ to 2 lines long, with 2 flowers and a normally flexuose rhachis. Glumes broad, obtuse, not so distinctly distichous as in most species though the insertion is really the same, 2 or rarely 3 outer empty ones shorter. Hypogynous bristles 6, rather longer than the nut, ciliate at the base with long hairs. Stamens 3. Nut ovoid, prominently 3-angled, smooth and shining.—*Chatospora nitens*, R. Br. *Prod.* 293, Hook. f. *Fl. Tasm.* ii. 82; F. v. M. *Fragm.* ix. 35; *Scirpus nitens*, Boeckl. in *Linnaea*, xxxvi. 696.

Hab.: Moreton Island, M'Gillivray.

3. **S. calostachyus** (spikes pretty), Benth. *Fl. Austr.* vii. 368. Stems 1 to 2 ft. high or more, rigid. Leaves at the base of the stem long, rigid, very narrow, with a prominent keel and slightly scabrous margins, the open sheaths bordered by a hyaline membrane, slightly ciliate at the top, and sometimes 1 or 2 leaves on the stem with longer closed sheaths and shorter lamina. Floral leaves or bracts similar, but gradually smaller and all very distant. Spikelets solitary or 2 in each sheath, on very unequal peduncles, and sometimes a second spikelet on one of the lower ones, the spikelets narrow-lanceolate, flat, dark brown in the typical form, about 1 in. long when fully out, with 3 to 5 flowers. Glumes acute, rigid, shortly ciliate on the edge, 4 to 6 outer ones empty and gradually shorter, the lowest very short. Hypogynous bristles 4 to 6, much shorter than the nut or 1 or 2 of them longer. Stamens 3. Nut narrow-ovoid, 3-angled, prominently tuberculate almost muricate.—*Chatospora calostachya*, R. Br. *Prod.* 293.

Hab.: Endeavour River, Banks and Solander; Moreton Island, M'Gillivray; Stradbroke Island, Rev. B. Scortechini and Bailey.

4. **S. scabripes** (peduncles rough), Benth. *Fl. Austr.* vii. 363. Stems 2 ft. high or more, somewhat flattened and grooved, leafless except a few long-distant brown sheaths shortly woolly at the orifice, with very short erect obtuse points. Flowering-sheaths similar but shorter, all distant. Peduncles 2 or 3 from each sheath, slender but rigid and very scabrous, all erect with a single erect spikelet or one from the lowest bract elongated with 2 or 3 spikelets. Spikelets narrow, acuminate, slightly flattened, $\frac{3}{4}$ in. long or perhaps rather more when fully out, with 1 or 2 flowers. Flowering glume acuminate but rather obtuse, outer empty ones 5 or 6 gradually shorter, all obtuse with an obtuse gland-like point. No hypogynous bristles. Stamens 3, with very long anthers. Nut not seen.

Hab.: Moreton Island, F. v. Mueller.

5. **S. brevifolius** (leaves short), R. Br. *Prod.* 281; Benth. *Fl. Austr.* vii. 370. Stems from a creeping rhizome rush-like, 1 to 2 ft. high or more, leafless except the brown sheathing scales at the base, the innermost with a rigid erect point or lamina rarely 1 in. long, the orifice not bearded. Panicle rather loose but very narrow, 3 to 6 in. long or more, the spikelets almost clustered on short peduncles, the lower clusters distant, or the panicle rather more compound with the lower branches elongated. Sheathing bracts tapering into short erect points or laminae. Spikelets linear-lanceolate, 5 lines long when full grown, brown, not so much flattened as in *S. melanostachyus*, with 3 to 5 flowers. Glumes obtuse or nearly acute, 2 to 4 outer empty ones shorter and more obtuse. No hypogynous bristles. Stamens 8. Nut obovoid, scarcely rugose.—F. v. M. *Fragm.* x. 29; Sieb. *Agrostoth.* n. 7.

Hab.: Near Brisbane, Bailey.

6. ***S. melanostachyus*** (spikes-black), *R. Br. Prod.* 281; *Benth. Fl. Austr.* vii. 370. Stems terete, usually 2 to 3 ft. high, but some specimens from various quarters marked as attaining 8 to 10 ft., leafless except a brown sheath at the base more or less bearded at the orifice, with a spreading obtuse rigid lamina of 1 to 3 lines. Panicle rather loose and often secund, oblong or thyrsoid, 3 to 6 in. long, the lower branches rather long. Sheathing bracts short, woolly at the orifice, with a small reflexed obtuse lamina. Spikelets all pedicellate, rather numerous, black, linear-lanceolate, flat, usually about 3 lines long but sometimes 4 lines, often slightly falcate, with 1, 2 or sometimes 3 flowers. Flowering glumes obtuse, about 4 outer empty ones gradually shorter and more acute. Hypogynous bristles either none or few and very short and unequal, rarely 1 as long as the nut. Stamens 3 or rarely 4. Nut obovoid, 3-ribbed, granular-tuberculate.—Böckel. in *Linnaea*, xxxviii. 284; F. v. M. *Fragm.* ix. 29; Nees in *Sieb. Agrostoth.* n. 3.

Hab.: Rockingham Bay, *Dallachy*; Wide Bay, *Leichhardt*; Brisbane River, *Bailey*.
Stems used for making dilly-bags, *Stradbroke Island*, *Watkins*.

7. ***S. sparteus*** (Broom-like), *R. Br. Prod.* 281; *Benth. Fl. Austr.* vii. 371. Stems very slender but rigid, 1 to 2 ft. long, leafless except the brown sheaths at the base bearded at the orifice, with a short recurved subulate point rarely lengthened into a lamina of 2 or 3 in., and occasionally 1 or 2 similar sheaths with short subulate laminae higher up the stem. Panicle narrow, loose, 1 to 2 in. long, besides a flowering bract occasionally at some distance lower down. Bracts like the lower sheaths but gradually shorter. Spikelets few within each sheath, all pedicellate or 2 or 3 on a short branch in the lower sheaths, all narrow, very acute, not much flattened, dark brown, about 4 lines long, with about 3 flowers. Glumes acuminate or almost obtuse, fringed with woolly hairs or at length glabrous, 5 or 6 outer empty ones gradually shorter. No hypogynous bristles. Stamens 3. Nut ovoid or obovoid, obtusely 3-angled, obscurely striate or smooth.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*; Wednesday Island, *Moseley*.

8. ***S. vaginatus*** (sheathed), *F. v. M. Herb.*; *Benth. Fl. Austr.* vii. 371. Stems 1 to 2 ft. or more long, leafless except a few distant brown sheaths about $\frac{1}{2}$ in. long, bearded at the orifice and bearing usually an erect rigid narrow lamina of $\frac{1}{2}$ to $\frac{3}{4}$ in., or rarely the lower ones with a narrow-linear leaf of 2 to 3 in., the stem readily disarticulating within each sheath. Panicle narrow, the short erect branches clustered, the lowest sometimes above 2 in. long. Lower sheathing bracts like the sheaths on the stem, the upper ones with very short points. Spikelets not numerous, all pedicellate but erect, dark brown, very narrow, slightly compressed, 4 to nearly 5 lines long, with about 3 flowers. Glumes acutely acuminate, glabrous or fringed with a few hairs, about 3 outer empty and gradually shorter. No hypogynous bristles. Stamens 3. Young nut obovoid, 3-angled.

Hab.: Brisbane River, Moreton Bay, *F. v. Mueller*.

9. ***S. falcatus*** (sickle shaped), *R. Br. Prod.* 282; *Benth. Fl. Austr.* vii. 372. Stems 2 to 3 ft. high, striate, often more or less flattened. Leaves at the base of the stem with short open sheaths produced into a concave erect lamina, often 2 lines broad at the base, but ending in a long subulate point, 1 or 2 of the leaves 1 ft. long or more, the stem-leaves few, with brown or black closed sheaths and shorter laminae. Panicle long and very narrow, the branches clustered and erect, the lower ones often distant and elongated, the whole panicle above 1 ft., the sheathing bracts like the stem-leaves but gradually smaller. Spikelets numerous, all pedicellate, light brown, linear-lanceolate, falcate or rarely straight, flat, varying from 4 to 6 lines long with 3 to 6 or rarely more flowers. Glumes acute

or the lower ones aristate, 2 or rarely 3 outer empty ones shorter. Hypogynous bristles none or very small, 1 rarely as long as the nut. Stamens 3. Nut obovoid, very obtuse, 8-ribbed, minutely striate or cancellate.—F. v. M. Fragn. ix. 29; *S. elatus*, Boeckel. in Flora, 1875, 117 (from the char. given).

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*; Burdekin River, *Armitage*; Bowen Downs, *Birch* (with remarkably large spikes); Mount Wheeler, *Thozet*.

10. *S. punctatus* (dotted), *R. Br. Prod.* 282; *Benth. Fl. Austr.* vii. 372. Stems 2ft. high or more, leafy. Lower leaves very long, floral bracts gradually shorter, all subulate-filiform almost from the sheath. Panicle 6in. to 1ft. long, leafy, slender and loose. Spikelets very numerous, all pedicellate, lanceolate, slightly falcate, more or less flattened, scarcely 2 lines long, rather pale brown, with 2 flowers. Glumes thinly membranous, rather obtuse, 2 outer empty ones shorter. No hypogynous bristles. Stamens 3. Nut ovoid-oblong, obtusely 3-angled, marked with impressed dots.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*.

* 11. *S. indutus* (covered), *F. v. M. Herb.*; *Benth. Fl. Austr.* vii. 372. Stems slender, attaining about 1ft., at first clothed with long spreading hairs but the older ones often glabrous. Leaves few at the base of the stem, almost subulate, 1 to 3in. long, the outer one with a short open sheath, the inner sheath close and slightly membranous at the orifice. Panicle very loose, with few spikelets, all on long pedicels, solitary or clustered in the axils of short slender dark brown sheathing bracts. Spikelets dark brown, lanceolate, flattened, about 3 lines long with 2 or 3 flowers. Glumes very acute or the inner ones obtuse, 4 to 6 outer empty ones gradually shorter with the points sometimes slightly spreading. Hypogynous bristles 6 or fewer, very irregular, 1 or 2 longer than the young nut, the others often very small. Stamens 3.

Hab.: Queensland, *F. v. M.*

12. *S. Brownii* (after Dr. R. Brown), *Hook. f. Handb. N. Zeal. Fl.* 298; *Benth. Fl. Austr.* vii. 373. Stems tufted, slender, often filiform, from 2 or 3in. to near 1ft. high. Leaves narrow-linear or filiform, a few at the base of the stem with short points or laminae, 1 to 3 higher up with closed sheaths and longer laminae. Spikelets few together in clusters or little umbels, the clusters sessile or pedunculate, several from each sheath, the lower ones distant, the whole forming a narrow panicle or small irregular umbel, or reduced to 2 or 3 rather dense clusters. Bracts with brown sheaths and leafy points. Spikelets linear or linear-lanceolate, brown or black, 2 to near 3 lines long, usually with 2 flowers. Glumes acute or the inner ones obtuse, 3 or 4 outer ones empty of which the 2 outermost very much shorter, the keel often minutely ciliate. Hypogynous bristles 6, very slender, from a little to very much longer than the nut. Stamens 3. Nut small, white, 3-ribbed, minutely reticulate under a lens. *Chatospora imberbis*, *R. Br. Prod.* 233; Boeckel. in *Linnaea*, xxxviii. 299; Sieb. *Agrostoth.* n. 27, *Hook. f. Fl. Tasm.* ii. 82, *F. v. M. Fragn.* ix. 35; *Isolepis margaritifera*, *Nees* in *Herb. Berol.*; *Scirpus margaritifera*, Boeckel. in *Linnaea*, xxxvi. 697; *Chatospora tenuissima*, *Steud. Syn. Glum.* ii. 162, from the char. given, not of *Hook. f.*

Hab.: East coast, *R. Brown*; Brisbane River, *F. v. Mueller, Bailey*.

19. ELYNANTHUS, Nees.

Spikelets clustered in a narrow panicle, with usually 2 hermaphrodite flowers close together on a short not flexuose rhaphis, both fertile or one sterile. Glumes distichous, 2 to 4 outer ones empty and a small empty one close above the flowers. No hypogynous bristles. Stamens 3 to 8. Style slender with a

thickened hard persistent base continuous with the ovary; stigmatic branches 3, or 4, filiform. Nut ovoid, crowned by the hard ovoid or oblong persistent base of the style, sometimes as big as itself and either continuous with it or slightly contracted under it.—Perennials with the habit of the narrow paniculate *Schanus*.

Besides the following Australian species which is endemic, the genus includes several from South Africa, the characters of some of which however require revision. The spikelets are nearly those of *Schanus*, but without the elongated flexuose rhachis, and the style and nut are almost as in *Caustis*.

1. ***E. capillaceus*** (hair-like), *Benth. Fl. Austr.* vii. 377. Stems filiform, $\frac{3}{4}$ to 1½ ft. long, leafless except a rather long sheath at the base, either truncate or with a setaceous lamina or point. Panicle small and narrow, the spikelets 3 or 4 together in the axil of the lower sheathing bracts, 1 or 2 in the upper ones, the bracts with short subulate points. Spikelets very narrow, 1½ to 2 lines long. Glumes acute or acuminate, 3 or 4 outer empty ones rather shorter. Flowers usually only 1 fertile. Stamens 3. Nut ovoid, crowned by the ovoid persistent base of the style as long as itself as in *Caustis*.—*Chatospora capillacea*, Hook. f. *Fl. Tasm.* ii. 81, t. 141 A; *C. capillaris*, F. v. M. *Fragm.* ix. 34.

Hab.: Mount Harold, *Meston*, what appears a luxuriant growth of this plant. The stems 30 in. long: the inflorescence in too early a stage to fully determine.

On examining more than a dozen spikelets from different specimens I have been unable to detect any trace of the 8 hypogynous scales figured in the plate, which must be very exceptional or perhaps some mistake of the artist.—*Benth.*

20. TRICOSTULARIA, Nees.

(Referring to the 8-ribbed nut.)

(*Discopodium*, *Steud.*)

Spikelets in a spikelike or loose or much-branched panicle, with 1 to 3 flowers, the upper one fertile, the lower sterile or male or deficient, the rhachis very short and straight. Glumes scarcely distichous, membranous, pale brown, 2 to 4 outer empty ones, and a small narrow empty one immediately above the upper flower. Hypogynous bristles 6 or fewer, short slender and usually unequal. Stamens 3. Style slender, deciduous; stigmatic branches 3, filiform. Nut ovoid, often contracted at the base but not distinctly stipitate.—Perennials. Leaves radical, often reduced to sheathing scales rarely 1 or 2 distant on the stem. Spikelets rather small, sessile or pedunculate, solitary or clustered in the axils of sheathing bracts of which the lower ones have sometimes leaflike laminæ, or variously paniculate.

Besides the Australian species of which there are 5 all endemic, one of them only found in Queensland, there is one in Ceylon and another in Borneo. The nut is nearly that of *Schanus*, but the flowers when more than one are close together without the more or less flexuose rhachis characteristic of *Schanus*, and it is the terminal not the lower one which is specially fertile.—*Benth.*

1. ***T. paludosa*** (a marsh plant), *Benth. Fl. Austr.* vii. 382. Stems slender, rather weak, 6 in. to 1½ ft. high. Leaves at the base of the stem much shorter, narrow-linear or almost subulate, and 1 or 2 on the stem passing into the floral bracts. Panicle long narrow and very loose, the spikelets not numerous, all pedicellate, the peduncle or branches 2 or 3 together in the axils of leafy bracts, the lower bracts distant with long linear-subulate laminæ, the upper ones small. Spikelets 2 to 2½ lines long, usually erect, lanceolate, more or less flattened, pale brown. Flowers usually 2, rarely 3, the upper one or rarely 2 fertile, the rhachis not elongated nor flexuose between them. Glumes distichous, acute or the outer one short and aristate, about 4 outer ones empty and a small empty glume close to the upper flower. Hypogynous bristles 6, shorter than the nut, shortly serrulate-ciliate. Stamens 3. Style slender, deciduous. Nut ovoid, finely 8-ribbed, smooth or minutely granular.—*Chatospora paludosa*, R. Br. *Prod.* 233; F. v. M. *Fragm.* ix. 35.

Hab.: Moreton Bay, F. v. *Mueller*.

21. LEPIDOSPERMA, Labill.

(Alluding to the scaly appearance of the seed.)

Spikelets paniculate, sessile, scarcely flattened, with 2 or more flowers, the uppermost alone fertile, or rarely only 1 flower, the rhachis very short. Glumes almost distichous, several or only 1 or 2 outer empty ones gradually shorter, and a narrow empty one close above the flower enclosed in the flowering glume. Hypogynous scales or bristles 6 or fewer by abortion, usually seta-like or very thin and hyaline or minute at the time of flowering, enlarged under the fruit, thickened white and almost spongy, acuminate or setiferous, closely appressed in two rows to the base of the fruit and sometimes slightly cohering to each other at the base. Stamens 3, or very rarely in abnormal flowers 4 or 5. Style slender and deciduous, with 3 or very rarely 4 filiform stigmatic branches. Ovary crowned by a thick hemispherical or cushion-like hardened apex (or base of the style?). Nut ovoid or oblong, obtusely 3-angled except the continuous obtuse apex.—Rhizome perennial. Stems flat, angular or terete. Leaves few at the base of the stem, equitant and vertically flattened or angular or terete like the stem, usually of the same breadth, and only to be distinguished from it by their sheathing base and their tapering to a fine point. Spikelets usually numerous, clustered or singly sessile along the branches of a terminal panicle, which is either large and diffuse or long and erect, or short and dense or spike-like. Outer bract subtending the panicle usually with an erect point or lamina, which varies very much in length in the same species but rarely exceeds the inflorescence; the bracts under the primary branches with short points to the sheathing base, the inner ones more or less glume-like.

The Australian species are perhaps all endemic, other species are found in New Zealand and in South China.

The genus is one of the most natural among Cyperaceæ, although when in flower it is chiefly distinguished by the foliage and inflorescence; the principal technical characters, the peculiar hypogynous scales, can often be ascertained only under the ripe or far advanced nut. At the time of flowering the bristles are often those of *Schænus* or of *Tricostularia*; as the ovary grows the peculiar apex is constant, so also are the full grown scales. In all these respects as well as in the position of the leaves, the inflorescence, the position of the flowers, the terminal one hermaphrodite and fertile, the others when present male or barren, the structure of the flowers and of the fruit there is no variation in the genus, and the species can only be distinguished by vague characters derived from the shape of the stem and leaves, the degree of development of the inflorescence, the number and shape of glumes, etc. The limits of the species are therefore often very vague.—Benth.

SERIES I. Longitudinales.—Stems flattened but very convex on both sides. Panicle narrow and dense, spike-like or with erect spike-like branches.

Spikelets very erect, with erect glumes.

Stems usually above 3 lines broad. Panicle 6 in. long or more 1. *L. exaltatum*.

SERIES II. Densifloræ.—Stems flat or very slightly convex on one or both sides with acute edges, 1 2 or rarely 3 lines broad. Panicle compound, short and dense, broad pyramidal ovate or rarely oblong, the branches or partial spikes, sessile or nearly so in the clusters.

Glumes acutely acuminate. 2. *L. concavum*.

SERIES III. Stenostachyæ.—Stems either broad and very flat and thin, or when very narrow slightly convex on one or both sides or angular. Panicle narrow, loose or elongated.

Stems not resinous, very flat $1\frac{1}{2}$ to $2\frac{1}{2}$ lines broad with very acute edges . . . 3. *L. laterale*.

1. *L. exaltatum* (tall), R. Br. Prod. 234; Benth. Fl. Austr. vii. 389. Stems 3 to 6 ft. high, 3 to 4 lines broad, flattened but convex on both sides and often hollow, the edges prominent, acute, slightly scabrous. Leaves the same breadth. Panicle 6 in. to 1 ft. long, erect, compound, the branches and spikelets numerous and erect. Lowest bract with a lamina rarely exceeding 1 in. Spikelets crowded, $2\frac{1}{2}$ to 3 lines long, with 1 rarely 2 barren flowers besides the perfect one. Glumes

acute or acuminate, 2 or 3 outer empty ones rather shorter. Scales very small when in flower, thickened but not so much enlarged under the fruit as in most species and narrow, not setiferous.—Nees in Pl. Preiss. ii. 90.

Hab.: Brisbane River, *Bailey*; Pine River, *Eades*.

2. *L. concavum* (concave), *R. Br. Prod.* 234; *Benth. Fl. Austr.* vii. 390. Stems 1 to 2ft. high, quite flat or very slightly convex on one side, $1\frac{1}{2}$ to $2\frac{1}{2}$ lines broad, the edges very acute, slightly scabrous. Leaves equitant, shorter than the stem and about as broad. Panicle in the typical form erect, compound, dense, oblong or thyrsoid $1\frac{1}{2}$ to 8in. long. Outer involucrel bract longer or shorter than the panicle. Spikelets densely crowded and clustered, about 8 lines long, with 1 or 2 barren flowers besides the perfect one. Glumes acute, the inner ones acutely acuminate, the outer with shorter points, about 4 outer empty ones gradually shorter. Scales or bristles at the time of flowering scarcely dilated at the base, normally thickened under the nut into lanceolate scales with a seta-like point often wearing away.—*L. squamata*, *R. Br. Prod.* 235; *F. v. M. Fragm.* ix. 26, but not of *Labill.*; *L. Sieberi*, *Kunth, Enum.* ii. 320; *Boeckl. in Linnea*, xxxviii. 318; *L. gladiatum* *Nees*, in *Sieb. Agrostoth.* n. 10, not of *Labill.*; *L. laterale*, *Hook. f. Fl. Tasm.* ii. 91, t. 147, not of *R. Br.*

Hab.: Moreton Island, *F. v. Mueller*; Rockhampton, *Thozet*. Common of forest land.

Var. *pyramidatum*. Panicle looser, often above 6in. long but very compound, the spikelets 3 lines long or more and the glumes acuminate as in the typical form.

Hab.: Moreton Bay, *F. v. M.*

3. *L. laterale* (lateral), *R. Br. Prod.* 234; *Benth. Fl. Austr.* vii. 393. Stems often above 2ft. high, $1\frac{1}{2}$ to 3 lines broad, very flat or slightly convex on one side with very acute cutting edges. Leaves as broad and sometimes as long, but most shorter. Panicle usually narrow and loose, 4 to 8in. long, the branches not numerous, the lower ones elongated but erect, the spikelets sessile, distinct or scarcely clustered. Lowest outer bract sometimes with an erect leafy lamina of several in. but often under 1in. the upper ones short. Spikelets about 2 lines long, with rarely more than 1 barren flower besides the perfect one. Glumes acute and sometimes produced into short points but not aristate, 3 or 4 outer empty ones gradually shorter. Hypogynous bristles or scales narrow at the time of flowering and hyaline; scales under the nut lanceolate, acuminate, tipped with seta-like points which however often wear away.—*L. lineare*, *Nees* in *Sieb. Agrostoth.* n. 9, *Kunth, Enum.* ii. 318, not of *R. Br.*; *L. concavum*, *Hook. f. Fl. Tasm.* ii. 91, t. 146, not of *R. Br.*

Hab.: Brisbane River, Moreton Bay, *Leichhardt*, *C. Stuart*, *Bailey* and other.

Var. *angustum*. Stems 1 to $1\frac{1}{2}$ line broad, often slightly convex along the middle at least on one side.—*L. longitudinale*, *R. Br. Prod.* 234, not of *Labill.*; *L. angustifolium*, *Hook. f. Fl. Tasm.* ii. 92, t. 147, B.

Hab.: Border of N.S.W., towards Wallangarra.

22. CLADIUM, P. Br.

(From the branched inflorescence of the European species.)

(*Baumea*, *Gaudich*; *Chapelliera*, *Nees*.)

Spikelets variously paniculate, with 1 to 3 hermaphrodite flowers but usually the lowest alone fertile. Glumes few, imbricate all round, 1 to 3 or very rarely 4 outer ones empty, and usually a small one above the perfect flower, either empty or with an imperfect flower, the flowering glumes not shorter than the outer empty ones. No hypogynous bristles. Stamens 3 or rarely fewer. Style deciduous, sometimes dilated at the base but continuous with the ovary; stigmatic branches 3, rarely 2, filiform. Nut ovoid or oblong, terete or obtusely triquetrous, smooth but rarely shining, crowned by the adnate base of the style often undistinguishable except by a slight discoloration; endocarp usually hard,

exocarp either thin or more or less thickened and corky especially at the apex.—Perennials, with horizontal or creeping rhizomes. Stems sometimes tall and leafy throughout or at the base only, sometimes rush-like with all the leaves reduced to sheathing scales. Leaves either terete, and continuous or marked with transverse septa, or vertically flattened, very rarely with the involute margins of *Gahnia*.

The genus in its typical form extends over the tropical and temperate regions of both the New and the Old World.

SECT. I. *Mucledium*.—Panicles densely corymbose. Outer empty glumes about 4. Flowers 2, 1 or rarely both fertile, and usually no terminal empty glume.

Stems tall, leafy throughout. Leaves flat 1. *C. mariscus*.

SECT. II. *Baumea*.—Panicles loose or thyrsoid or narrow. Outer empty glumes 1 to 3, and usually a small terminal glume either empty or with a rudimentary flower. Leaves chiefly at the base of the stem or none.

Spikelets 2 or 3-flowered (flowers all apparently perfect but only one fertile).

Leaves terete, transversely septate. Panicle very large, somewhat drooping. Spikelets very numerous but not clustered. Glumes not ciliate 2. *C. articulatum*.

Leaves terete, continuous or obscurely septate. Panicle erect, rigid. Spikelets densely clustered. Glumes ciliate 3. *C. glomeratum*.

Spikelets 1-flowered.

Panicles thyrsoid or loosely branched, erect. Leaves few long and erect. Spikelets numerous.

Leaves terete, about 1 line broad. Panicle thyrsoid 4. *C. teretifolium*.

Leaves angular or flat with a prominent midrib, 1 to 2 lines broad.

Panicle thyrsoid 5. *C. tetraquetrum*.

Panicle narrow, almost spikelike or with few erect branches. Spikelets few. Nut smooth and shining.

Leaves vertically flattened but narrow. Stem under 1ft. 6. *C. schænoides*.

Stems leafless except short points to the sheaths, usually above 1ft. high, rarely intermixed with a few radical stem-like leaves.

Flowering glume spreading, twice as long as the nut 7. *C. Gunnii*.

Flowering glume appressed, about as long as the nut.

Stems slender, 1 to 2ft. high 8. *C. juveum*.

1. *C. mariscus* (a marsh plant), *R. Br.*; *Kunth, Enum.* ii. 303; *Benth. Fl. Austr.* vii. 402. Stems 3 to 6ft. high, terete, leafy throughout and often producing tufts of leaves or leafy branches from the upper axils. Leaves nearly erect, flat, the keel and edges scabrous, the lower nearly as long as the stem. Panicles compound and corymbose in the upper axils, the whole forming a leafy panicle often above 1ft. long. Spikelets exceedingly numerous, in small but numerous clusters, brown, ovoid or oblong, about 2 lines long. Glumes broad, obtuse, about 4 outer empty ones gradually shorter than the flowering ones. Flowers usually 2, both hermaphrodite or one (the lower or sometimes the upper one) male, and rarely both fertile, and very rarely a terminal minute empty glume. Stamens 2 or rarely 3. Style branches 8 or rarely 2. Nut nearly as long as the glumes, almost drupaceous, the exocarp thick especially the upper end and sometimes corky, the endocarp much shorter and hard.—*Boeckl. in Linnea*, xxxviii. 222; *Reichb. Ic. Fl. Germ.* t. 287; *F. v. M. Fragm.* ix. 14.

Hab.: Rockhampton, *Thozet*; Bowen Downs, *Birch*.

Widely dispersed over the tropical regions of the New and the Old World and over more-temperate Asia and Europe.

2. *C. articulatum* (jointed), *R. Br. Prod.* 237; *Benth. Fl. Austr.* vii. 403. Stems 3 to 6ft. high, terete, but marked with more or less distinct transverse septa almost disappearing below the panicle. Leaves erect, terete and stemlike, the transverse septa very prominent, the lower ones very long, the upper ones shorter with long continuous closed sheaths. Panicle very compound, somewhat nodding, 1 to 1½ft. long, the very numerous branches and peduncles clustered within sheathing bracts of which the lowest often produced into a terete acute.

septate lamina of 1 to 2 in. Spikelets exceedingly numerous, brown, about 2 lines long, with 3 to 5 hermaphrodite flowers, but usually only the lower one fertile. Glumes broad, membranous, acute, the upper ones gradually narrower and more obtuse but not shorter, 2 or rarely 3 outer ones empty and sometimes almost aristate, and the terminal one usually small empty or with an imperfect flower. Stamens 3. Style-branches 3, short. Nut obovoid, at first triquetrous, the broad obtusely conical or ovoid solid apex often as long as the nucleus or endocarp.—F. v. M. *Fragm.* ix. 14; *Baumea loculata*, Boeckl. in *Linnæa*, xxxviii. 243.

Hab.: Rockingham Bay, *Dallachy*; Bowen Downs, *Birch*; Brisbane River, Moreton Bay, F. v. *Mueller*, *Leichhardt* and others.

Also in New Zealand and in New Caledonia.

3. **C. glomeratum** (clustered), *R. Br. Prod.* 237; *Benth. Fl. Austr.* vii. 404. Stems 1 to 3 ft. high, terete, rather slender. Lower leaves few, erect, terete, 6 in. to 1 ft. long or more, dilated into short sheaths, a few inner ones with longer sheaths and shorter laminae. Spikelets in ovoid or nearly globular dense clusters 3 to 4 lines diameter, the lower clusters in a partial narrow pedunculate panicle, the upper ones on short and long peduncles clustered in the axils of the sheathing bracts, the uppermost sessile in a more compound cluster, the whole forming a narrow irregular panicle. Sheathing bracts mostly open to the base, the upper ones small and glume-like. Spikelets oblong, brown, 2 to 3 lines long. Glumes membranous, broad, ciliate, acuminate, 2 or 3 outer ones empty. Flowers usually 2, sometimes 3, all hermaphrodite or the upper one male and usually only the lower one fertile. Stamens 3. Style-branches 3. Nut ovoid-oblong, nearly as long as the glume, when unripe with 3 raised angles and crowned by the pubescent base of the style, when ripe the angles are nearly obliterated and the nut is shining (red in Brown's specimens), the base of the style scarcely distinct except as an opaque apex.—Kunth, *Enum.* ii. 304; Sieb. *Agrostoth.* n. 4; Hook. f. *Fl. Tasm.* ii. 94; F. v. M. *Fragm.* ix. 15; *C. dubium*, Nees in Sieb. *Agrostoth.* n. 5, Spreng. *Syst. Cur. Post* 21; *Baumea rubiginosa*, and *B. Brownii*, Boeckl. in *Linnæa*, xxxviii. 241, 242.

Hab.: Gilbert River, F. v. *Mueller*; Moreton Bay and Island, *McGillivray*, F. v. *Mueller*, *Bailey*; Rockhampton, *Thozet*; Bowen Downs, *Birch*.

The species is also in New Zealand.

4. **C. teretifolium** (leaves terete), *R. Br. Prod.* 237; *Benth. Fl. Austr.* vii. 406. Stems 1 to 3 ft. high, terete or slightly compressed, striate but not angular. Leaves few, rather long, terete, acute, erect, with long loose sheaths, the inner one with a short lamina. Panicle oblong or thyrsoid, dark brown, 2 to 6 in. long, erect and much branched, but usually dense and narrow. Lowest bract a loose membranous sheath with a short erect point, the others gradually smaller and more glume-like. Spikelets numerous, sessile, 2 to 2½ lines long, with 1 hermaphrodite flower. Glumes membranous, keeled, acutely acuminate, ciliate, usually 3 empty, the outer one short, and a small glume either empty or enclosing a male flower above the flowering glume or within it. Stamens 3. Nut (only seen in the Moreton Bay specimens) ovoid-globular, 1½ line long, with many much raised longitudinal ridges, smooth for a very short space at the base, and crowned by the scarcely distinct adnate base of the style.—Boeckl. in *Linnæa*, xxxviii. 234; F. v. M. *Fragm.* ix. 15; Sieb. *Agrostoth.* n. 6.

Hab.: Sandy Cape, *R. Brown*; Brisbane River, Moreton Bay, F. v. *Mueller*. Also in New Zealand.

5. **C. tetraquetrum** (4-cornered), *Hook. f. Fl. Tasm.* ii. 95, t. 149; *Benth. Fl. Austr.* vii. 406. Stems 1 ft. high or more, scarcely compressed, striate and often angular. Leaves few, rather long, rarely above 1 line broad, rigid, somewhat flattened and striate, with a raised midrib on each side, or in larger

specimens acutely 4-angled, the inner leaf reduced to a long sheath with a short lamina. Panicle oblong or thyrsoid, dark brown, $1\frac{1}{2}$ to 4 in. long, dense throughout or interrupted at the base. Outer bract a loose membranous sheath with a short erect point, the others gradually smaller and more glume-like. Spikelets sessile, usually numerous, 2 to $2\frac{1}{2}$ lines long, with 1 hermaphrodite flower. Glumes membranous, keeled, acutely acuminate, ciliate, usually 3 empty, the outer one short, and a small glume either empty or enclosing a male flower above the flowering glume and within it. Stamens 3. Nut obovoid, $1\frac{1}{2}$ line long, marked with raised ridges or reticulation, shortly smooth at the base, crowned by the more or less distinct adnate base of the style.—Bœckel. in Linnæa, xxxviii. 235; *Lepidosperma tetragona*, Labill. Pl. Nov. Holl. i. 17, t. 17.

Hab.: About Wallangarra.

Var.: *planifolium*. Leaves flat, 1 to 2 lines broad, strongly striate, with a prominent midrib on each side. Inflorescence, bracts, 1-flowered spikelets, nuts, etc., quite as in the normal *C. tetraquetrum*, except that the spikelets are almost clustered, approaching those of *C. glomeratum*.

Hab.: About Wallangarra.

6. *C. schœnoides* (Schœnus-like), R. Br. Prod. 237; Benth. Fl. Austr. vii. 407. Stems 6 in. to 1 ft. or rarely $1\frac{1}{2}$ ft. high, more or less flattened. Leaves at the base of the stem equitant, longer or shorter, vertically flattened, striate but without any raised midrib, rigid, straight or falcate, very acute, rarely above 1 line broad. Panicle narrow, 1 to $1\frac{1}{2}$ in. long, almost spike-like but flexuose and interrupted. Lower bracts with a short sheath and erect rigid acute lamina, sometimes very short, sometimes 1 to 2 in. long, the upper bracts gradually smaller and more glume-like. Spikelets few, somewhat clustered, all sessile about 2 lines long, 1-flowered. Glumes acute or acuminate, erect, slightly striate, scarcely ciliate, 3 outer ones empty of which the lowest short, and above the flowering glume and enclosed in it a small empty one rarely including a male flower. Stamens 3. Style-branches 3. Nut ovoid, very slightly compressed, very obtuse, dark-coloured, about 1 line long, smooth and shining when ripe, and often hanging by the persistent filaments as in several *Gahnia*.—Hook. f. Fl. Tasm. ii. 96; *Schœnus acutus*, Labill. Pl. Nov. Holl. i. 18, t. 18; *S. falcatus*, Nees in Sieb. Agrostoth. n. 18; *Baumea schœnoides*, Bœckel. in Linnæa, xxxviii. 246.

Var. *elongatum*. Stems and leaves often 1 ft. or more, the panicle longer, the outer sheathing bract with a very short lamina.

Hab.: Moreton Island, F. v. Mueller.

7. *C. Gunnii* (after D. Gunn), Hook. f. Fl. Tasm. ii. 95, t. 148; Benth. Fl. Austr. vii. 407. Stems slender but rigid, terete, from ~~under 1 to 2 ft.~~ ^{under 1 to 2 ft.} high or even more, leafless except sheathing scales at the base or with one long terete stem-like leaf and occasionally a few similar radical leaves intermixed in the tuft. Panicle narrow, interrupted, with few erect branches, sometimes almost spike-like. Lower sheathing bract with a short subulate or rarely a longer leaf-like point, the upper ones gradually smaller and more glume-like. Spikelets sessile, distinct, somewhat distant, 1-flowered. Glumes rather rigid, erect at first but spreading when in fruit, the flowering-one narrow lanceolate, acutely acuminate, often 3 lines long, 2 outer empty ones shorter broader with fine points, the terminal empty glume very small or deficient. Stamens 3. Nut ovoid, at first prominently 3-ribbed, quite smooth and shining when ripe, tipped with the small adnate base of the style.—Bœckel. in Linnæa, xxxviii. 235; F. v. M. Fragm. ix. 15; *C. laxiflorum*, Hook. f. l.c.; *Gahnia sulcata*, F. v. M. First Gen. Rep. 20; *Schœnus punctatus*, Nees in Sieb. Agrostoth. n. 19; *S. nudus*, Steud. Syn. Glum. ii. 165; *Cladium nudum*, Bœckel. in Linnæa, xxxviii. 236.

Hab.: About Wallangarra.

The species is also in New Zealand.

8. **C. junceum** (Bush-like), *R. Br. Prod.* 287; *Benth. Fl. Austr.* vii. 408. Stems slender but rigid and rush-like, from under 1 to above 2 ft. high, leafless except a few distant closed sheaths with a very small erect or spreading lamina, or sometimes only 2 or 3 sheaths at the base. Spike-like panicle short, terminal, $\frac{1}{2}$ to a little more than 1 in. long; the subtending sheathing bract very small. Spikelets few, somewhat flattened, of a rich brown, about 2 lines long, sessile along the short branches, each within a broad prominently 5 or 7-nerved glume-like bract, and containing a single hermaphrodite flower. Glumes almost distichous, acute with prominent ciliate keels, the sides membranous, 2 or 3 outer empty ones shorter, the flowering glume erect, and above it and enclosed within it a small thin terminal glume, with usually a male flower. Stamens 3. Nut obovoid, nearly as long as the glume, very obtuse.—Bœckl. in *Linnaea*, xxxviii. 287; Hook. f. *Fl. Tasm.* ii. 95; F. v. M. *Fragm.* ix. 16.

Hab.: Burnett River, *F. v. Mueller*, and about Wallangarra. Also in New Zealand.

28. GAHNIA, Forst.

(After H. Gahn.)

(*Morelotia*, *Gaudich*; *Lampocarya*, *R. Br.*)

Spikelets variously paniculate, with 1 hermaphrodite flower and usually 1 male flower below it. Glumes several, imbricate all round, 4 or more outer ones empty the flowering glumes shorter, broad, obtuse and closely enveloping the flowers and nut, without any empty glume above the flower. No hypogynous bristles. Stamens 3 or more frequently from 4 to 6. Style deciduous, continuous with the ovary; stigmatic branches in the perfect flower 3 to 5 (or 3 with 1 or 2 bifid), filiform. Nut obovoid ovoid or almost fusiform, obscurely or not all 3-angled, usually smooth and shining when fully ripe, the endocarp hard, smooth or transversely rugose inside, the exocarp but little thickened.—Perennials with a hard or creeping rhizome. Stems sometimes very tall, in a few species shorter and slender. Leaves terete and furrowed along the inside or with involute margins so as to appear terete, always ending in long subulate points. Panicles either large loose and drooping, or long and erect or spike-like. Spikelets black or in a very few species brown. Filaments in some species becoming very much lengthened. Nuts in several species of a bright brown-red, in others black, grey, or almost white, and frequently after having been cut remaining hanging to the spikelet by the filaments, persistent at their base, and retained at the other end by the closely involute margins of the inner empty glumes.

The genus extends to New Zealand, the Malayan Archipelago and the Pacific Islands.

SECT. I. **Lampocarya**.—Spikelets with a single terminal hermaphrodite flower or very rarely with a second male or imperfect one.—Panicle long and narrow, the spikelets in compound clusters or short spikelike branches, sessile or shortly pedunculate along the main rachis.

Spikelets 3 to 4 lines long. Flowering glumes broad and very obtuse. Nuts

about 3 lines long. Stamens usually 6 1. *G. aspera*.

Spikelets under 2 lines. Nuts 1 to $1\frac{1}{2}$ line long.

Clusters of spikelets at first oblong. Glumes broad, shortly acuminate.

Stamens 3, rarely 4 2. *G. melanocarpa*.

SECT. II. **Mugahnia**.—Spikelets with a terminal hermaphrodite flower and a precocious male or barren one below it.—Panicles loose, narrow, thyrsoid or spreading.

Outer glumes numerous, short, obtuse or slightly acuminate 3. *G. psittacorum*.

1. **G. aspera** (rough), *Spreng. Syst.* ii. 114; *Benth. Fl. Austr.* vii. 412. Stems rigid, 2 to 3 ft. high. Leaves very long, with involute scabrous margins, becoming almost terete, with long subulate points. Clusters of spikelets very dense, in short compound sessile spikes in the axils of the upper or floral leaves, forming a dense spikelike slightly interrupted leafy panicle. Lower leafy bracts very long, with short sheaths, the upper gradually shorter with broad lanceolate

bases, the inner bracts more glume-like. Spikelets mostly about 4 lines long, with a single hermaphrodite flower. Empty glumes 7 or 8, the outer ones narrow, acuminate or aristate, with rigid ciliate keels passing into a few inner shorter very broad and obtuse membranous ones, the flowering glume still thinner and shorter at the time of flowering. Stamens usually 6, rarely 5 or 4. Style-branches 8, all simple or one divided nearly to the base. Nut ovoid-oblong to almost globular, often 3 lines long, slightly mucronate with the base of the style, very smooth, shining and brown-red when fully ripe, at first closely enveloped in the 2 inner glumes, but at length forced out and remaining long suspended by the filaments persistent at the base of the nut and caught at the other end in the points of the longest empty glumes.—Bœckel. in *Linnaea*, xxxviii. 344; *Lampocarya aspera*, R. Br. Prod. 238; *Cladium asperum*, F. v. M. Fragn. ix. 12.

Hab.: Keppel Bay, Broadsound and Shoalwater Bay, R. Brown; Rockingham Bay, Dallachy; Rockhampton, O'Shanassy, Thozet & Ipswich, Nerrut; Mereton Bay, Leichhardt.

Also the same or a very closely allied species in New Caledonia and the Fiji Islands; and the Sandwich Islands, *G. globosa*, H. Mann, or *G. mucronata*, Bœckel. may also be not really distinct.

Hexalepis scabrifolia, Bœckel. in *Flora*, 1875, 118, from Brisbane River, Amalia Dietrich, appears to me to be that state or variety of *G. aspera*, in which the nuts of a straw-colour or rarely dark-brown and opaque are not yet forced out of the spikelets and remain sessile and erect. In some instances specimens from Queensland with straw-coloured nuts, and others with brown shining exerted hanging nuts have been sent as belonging to this species.—Benth.

2. *G. melanocarpa* (black fruit), R. Br. Prod. 239; Benth. *Fl. Austr.* vii. 418. Stems usually several feet high. Leaves very long, with involute scabrous margins, ending in long subulate points, the floral ones gradually smaller, all rigid and erect. Panicle narrow and dense, often above 1 ft. long and interrupted at the base, very compound, with erect spikelike or thyrsoid branches, the lower ones 2 to 4 in. long, the upper much shorter, very narrow when in flower, broader and denser when in fruit. Smaller bracts shortly aristate, those under the spikelets almost glume-like. Spikelets very numerous, more or less clustered, scarcely above $1\frac{1}{2}$ line long. Outer empty glumes about 8, acuminate and almost aristate, 1 or 2 inner ones also empty, and the flowering glume thinly membranous, almost hyaline, obtuse and closely enveloping the single hermaphrodite flower, without any second male flower or inner empty glume. Stamens 8 or rarely 4, at length much elongated. Nut small obovoid or ovoid, black and shining when quite ripe.—*Cladium melanocarpum*, F. v. M. Fragn. ix. 13.

Hab.: Near border of N.S.W. about Wallangarra.

3. *G. peltacorum* (parrot-like), Labill. *Pl. Nov. Holl.* i. 89, t. 115; Benth. *Fl. Austr.* vii. 418. "Yerer," Cape Bedford, Roth. Stems stout, terete below the inflorescence, 4 to 8 ft. high. Leaves long, with very scabrous involute margins, ending in long subulate points. Panicle often 1 to 2 ft. long, very black, oblong or thyrsoid, often one-sided, very compound, the numerous branches spreading drooping or nearly erect. Lower sheathing bracts produced into long subulate scabrous leaflike points or laminae, the upper ones gradually smaller. Spikelets exceedingly numerous, 2 to 3 lines long. Empty glumes in the typical forms 10 to 12, very obtuse or rarely almost acute, the outer ones very small but gradually increasing in length; flowering glumes much smaller, thinly membranous and very obtuse, the innermost one often minute. Flowers 2, but so close together as to appear within the same glume, outer one male and very precocious, the inner one hermaphrodite and fertile. Stamens in each 4 or rarely 5 or 6; filaments moderately or very long after flowering. Style-branches usually 4 of equal length, but one of them equally divided so as to appear 5. Nut ovoid, hard,

very smooth and shining, of a rich brown-red when quite ripe, 1 to 1½ line long.—*R. Br. Prod.* 288; *Hook. f. Fl. Tasm.* ii. 97; *Bœckel. in Linnæa*, xxxviii. 345; *Cladium filum* and *C. radula*, *Nees in Sieb. Agrostoth.* n. 11 and 12, not of *R. Br.*; *Cladium peittacorum*, *F. v. M. Fragm.* ix. 18; *G. Sieberiana*, *Kunth, Enum.* ii. 882.

Hab.: Rockingham Bay, *Dallachy*; Moreton Bay, *F. v. Mueller*; and inland in swamps.

The species, easily distinguished among all the large black paniced ones, by the number of short closely imbricate outer glumes, is very variable in the apex of these glumes more or less obtuse, in the length to which the filaments protrude after losing their anthers, and especially in the size of the nuts.

Leaf-buds eaten.—*Roth*.

24. CAUSTIS, *R. Br.*

(*Eurostorrhiza*, *Steud.*)

Spikelets with 1 hermaphrodite flower and often 1 male one below it, narrow, sometimes unisexual by abortion. Glumes 8 or 4, imbricate all round the rhachis, acuminate or aristate, 1 or 2 outer empty ones shorter. No hypogynous bristles or scales. Stamens 3 to 6. Style slender, with a thick hard, persistent base; stigmatic branches 3, filiform. Nut ovoid or oblong crowned by the hard ovoid or oblong base of the style, sometimes as big as itself and either continuous with it or slightly contracted under it.—Stems from a perennial rhizome with thick fibrous roots, usually leafless except sheathing scales like those of *Restiaceæ* but closed, very rarely produced into linear subulate leaves, more or less paniculately branched, the branches either erect and straight or numerous curved flexuose or revolute, the short sterile branchlets and peduncles clustered within each sheath. Spikelets sometimes unisexual by abortion, the males and females on separate stems though proceeding from the same rhizome.

The genus is endemic in Australia. Some specimens assume so much the aspect of some species of *Hypolena* (*Restiaceæ*) as to be occasionally confounded with them in herbaria.

Spikelets (constantly?) hermaphrodite and uniform. Beak or appendage to the nut large and distinct.

Flowering branches erect and straight. Spikelets sessile or shortly pedunculate. Stamens usually 5 (4 to 6)

Pedicels slender, solitary or few together in clusters of curved flexuose or involute branchlets. Stamens 3

1. *C. pentandra*.

2. *C. flexuosa*.

1. ***C. pentandra*** (5 stamens), *R. Br. Prod.* 240; *Benth. Fl. Austr.* vii. 420. Stems 2ft. high or more, terete below the branches, but the branches when 2 or more in a cluster flattened or excavate along the inner side with acute angles, the whole cluster terete. Flowering branches long and erect; clusters of barren ones few and often 3 to 4in. long, erect or slightly curved. Sheathing scales usually tapering into long points. Spikelets rather numerous, erect, usually a sessile and pedunculate one from the same sheath, 6 to 8 lines long, all apparently equally fertile. Glumes rigid, minutely pubescent, with long subulate points or awns. Stamens 5 in the hermaphrodite flower, often 2 or 3 only in the male one. Persistent style-base oblong, furrowed, pubescent, larger than the nut.—*Hook. f. Fl. Tasm.* ii. 98; *F. v. M. Fragm.* ix. 19; *Eurostorrhiza Urvillei*, *Steud. Syn. Glum.* ii. 265.

Hab.: Queensland, *F. v. M.*

2. ***C. flexuosa*** (flexuose), *R. Br. Prod.* 289; *Benth. Fl. Austr.* vii. 421. Stems 1 to 2ft. high or even more; branches numerous, solitary within the lower sheaths, clustered in the upper ones and often several times divided, the ultimate clustered branches filiform, 1 to 2in. long or even longer, all very flexuose or incurved. Sheathing scales brown, with short erect points. Spikelets single, on pedicels mixed with the clustered branches and resembling them, very narrow linear, 3 to 4 lines long, all apparently equally fertile. Glumes narrow, acute,

the lower empty ones shorter and more aristate. Persistent style-base brown, often as long as the nut and slightly contracted at the base, more or less pubescent at the time of flowering, usually glabrous on the ripe nut.—Kunth, Enum. ii. 808, partly; Guillem. Ic. Pl. Austral. t. 14; F. v. M. Fragm. ix. 19; *Pectio crispatus*, Nees in Sieb. Agrostoth. n. 87.

Hab.: Islands of Moreton Bay and southern coastal swamps.

25. SCLERIA, Berg.

(From *scleria*, hardness; alluding to the indurated fruit.)

(*Diplazum*, R. Br.; *Sphaeropus*, Boeckl.)

Flowers unisexual in unisexual or androgynous spikelets, the female flowers always solitary in the spikelet, the males usually several, placed above the female one in the androgynous spikelets. Glumes imbricate all round, 1 to 3 outer ones empty. No hypogynous bristles or scales. Stamens 1 to 8. Style slender, deciduous, with 8 filiform stigmatic branches. Nut globular or ovoid, usually white, raised on a thickened entire or more or less 3-lobed single or double disk.—Perennials or rarely annuals. Stems triquetrous, leafy, the leaf-sheaths often but not always terminating in a prominent ligula opposite the lamina. Spikelets in clusters or small corymbose or oblong panicles, terminal and axillary, or in a large compound terminal panicle.

The genus is generally spread over the tropical and subtropical regions of the New and the Old World, extending also into the temperate regions of North America.

SERIES I. Axillares.—Small annuals. Spikelets small, strictly unisexual, in little axillary or terminal sessile clusters, the males with 1 to 3 flowers.

Two upper glumes of the female spikelets enclosing the nut and 3-toothed . . . 1. *S. caricina*.
Two upper glumes of the female spikelets enclosing the nut and entire . . . 2. *S. pygmaea*.

SERIES II. Laxe.—Weak plants under 1 ft., probably annual. Spikelets strictly unisexual, in axillary clusters or few in loose spikes, the males with several flowers.

Spikelets in axillary clusters or small cymes. Outer persistent disk broadly cupular, inner adnate, very shortly 3-lobed . . . 3. *S. rugosa*.
Spikelets few, small, in loose spikes. Outer disk scarcely prominent, inner adnate, shortly 3-lobed . . . 4. *S. laxa*.

SERIES III. Subspicatos.—Perennials. Inflorescence scarcely branched. Fertile spikelets more or less androgynous or at least with empty glumes above the female flower.

Nut tuberculate. Disk-lobes broad, membranous, spreading . . . 5. *S. Brownii*.
Nut smooth and shining. Outer persistent disk, cupular, entire; inner obsolete . . . 6. *S. lithosperma*.
Nut tuberculate or reticulate. Disk-lobes adnate, very short broad and thick . . . 7. *S. tessellata*.

SERIES IV. Polystachym.—Perennials. Panicles branched, axillary and terminal. Spikelets unisexual or the fertile ones androgynous.

Leaf-sheaths with acute angles scarcely or not at all winged.
Panicles scarcely branched. Nut tuberculate or reticulate. Disk-lobes very short and broad . . . 7. *S. tessellata*.
Panicles dense, with numerous spikelets.
Nut smooth and shining. Disk-lobes broad, obtuse, entire . . . 8. *S. margaritifera*.
Nut rugose or nearly smooth. Disk-lobes broad, denticulate at the end . . . 9. *S. Graeffeana*.
Leaf-sheaths distinctly winged on the angles.
Panicle loose, not much branched. Disk-lobes acute . . . 10. *S. hebecarpa*.
Panicle dense with numerous long subulate bracts. Disk-lobes broad, usually very obtuse . . . 11. *S. elkenensis*.

SERIES V. Dicles.—Spikelets strictly dioecious, small, densely clustered, in numerous short axillary and terminal panicles.

Disk-lobes broad, membranous, spreading . . . 12. *S. sphacelata*.

1. ***S. carleina*** (near a *Carex*), *Benth. Fl. Austr.* vii. 426. A diffuse branching annual, attaining 6 to 9 in. but often smaller. Leaves linear or linear-lanceolate, obtuse or acute, $\frac{1}{2}$ to 2 in. long, the sheaths striate and keeled. Spikelets unisexual, under 1 line long, in little dense axillary clusters sessile or very shortly pedunculate, each spikelet in the axil of a thin glume-like bract. Male spikelet: Glumes about 8, very thin and narrow; flowers usually 2, each with 1 or 2 stamens. Female spikelet: Glumes usually 8, the two inner ones ovate-lanceolate, acute, with an acute tooth on each side shorter than the central point; flower 1 only, without any empty glumes above it. Nut closely enveloped in the 2 enlarged several-nerved glumes, globular, reticulate and pitted, slightly hispid. Disk adnate, small, with a scarcely prominent 8-angled or 8-lobed margin.—*Diplacrum caricinum*, R. Br. Prod. 241; Kanth, Enum. ii. 360; Endl. Iconogr. t. 25; Boeckl. in Linnæa, xxxviii. 434; *D. tridentatum*, Brongn. in Duperr. Voy. Bot. t. 26.

Hab.: Endeavour River, Banks and Solander.

Common in tropical Asia from Ceylon to Hongkong and the Malayan Archipelago.

2. ***S. pygmæa*** (dwarf), R. Br. Prod. 240; *Benth. Fl. Austr.* vii. 427. A dwarf branching annual, rarely exceeding 2 in. Leaves linear-lanceolate, acute, $\frac{1}{2}$ to 1 in. long. Spikelets unisexual, 1 to $1\frac{1}{2}$ line long, very numerous in little axillary and terminal sessile clusters, the inner bracts subulate-acuminate. Male spikelet: Glumes 2 or 3, very narrow and hyaline, usually enclosed in the longer subtending bract; flowers 1 or 2 each with 1 or 2 stamens. Female spikelet: Glumes usually 8, the inner ones lanceolate, acutely acuminate, finely several-nerved, quite entire but dilated below the middle, with membranous margins enclosing the fruit; no empty glumes above the flower. Nut globular, about $\frac{1}{2}$ line diameter, prominently 8-ribbed, tuberculate-rugose between the ribs. Disk small, adnate, with 8 slightly prominent semi-circular lobes.—F. v. M. ix. 22; *Hypoporum pygmaum*, Nees in Linnæa, ix. 303; *Sphaeropus pygmaus*, Boeckl. in Linnæa, xxxviii. 436.

Hab.: Endeavour River, Banks and Solander; Rockingham Bay, Dallachy.

3. ***S. rugosa*** (rough), R. Br. Prod. 240; *Benth. Fl. Austr.* vii. 428. Weak and branching, apparently annual, 6 in. to 1 ft. high. Leaves grass-like, the lower ones sometimes longer than the stem. Clusters of spikelets axillary and terminal sometimes almost sessile, solitary but compound, and often with 1 or 2 pedunculate clusters or flowering branches with the sessile one in the lower axils, the foliage and inflorescence either sprinkled with short hairs or quite glabrous. Male spikelets stipitate in the clusters, about 1 line long, with several flowers. Outer empty glumes usually 3, acuminate, with ciliate keels; flowering glumes very narrow and hyaline, not exceeding the outer empty ones. Stamens 1 or 2 in each flower. Female spikelets nearly sessile. Glumes usually 3, acuminate, with ciliate hirsute keels, about $1\frac{1}{2}$ line long. No empty glumes above the flower. Nut globular, pitted and rugose. Disk double, the external persistent one broadly cupulate and entire, the inner adnate one with an undulate or obtusely 8-lobed margin.—F. v. M. Fragm. ix. 22.

Hab.: Endeavour River, Banks and Solander; Rockingham Bay, Dallachy.

This species closely connects the preceding with the following ones.

4. ***S. laxa*** (loose), R. Br. Prod. 240; *Benth. Fl. Austr.* vii. 428. Stems weak and slender, 6 in. to 1 ft. high. Leaves long and narrow, chiefly at the base of the stem, the floral ones similar but shorter. Spikelets unisexual, not numerous, in a terminal almost simple loose and interrupted spike, and a few similar spikes on long filiform peduncles in the axils of distant leafy bracts. Male and female spikelets equally sessile or nearly so, in little clusters usually of 2 males and 1 female, all under 2 lines long. Male flowers several, the glumes

very narrow. Stamens usually 2. Glumes in the female spikelet 3 or 4, broader than in the males, membranous, acuminate, no empty ones above the flower. Nut ovoid-globular, white, reticulate. Disk adnate, with 8 short undulate lobes, at first sometimes rather acute, but thickened and obtuse with recurved sinuses under the ripe nut, the outer disk not prominent.—F. v. M. *Fragm.* ix. 21; *S. Nova-Hollandiæ*, Boeckl. in *Flora*, 1875, 120 (from the char. given).

Hab.: Rockingham Bay, *Dallachy*; Brisbane River, *Bailey*; Port Mackay, *Amalia Dietrich*.

5. *S. Brownii* (after Dr. R. Brown), *Kunth, Enum.* ii. 349; *Benth. Fl. Austr.* vii. 429. Stems slender, 1 to 2 ft. high. Leaves long and narrow, rather rigid, very scabrous or nearly smooth, the sheaths often pubescent and slightly fringed at the orifice, the floral leaves or bracts similar, the upper ones shorter, but all leaf-like and distant. Spikelets androgynous or male, 2 to near 3 lines long, several together in axillary and terminal sessile or pedunculate clusters. Outer empty glumes 2 or 3, lanceolate, acuminate, the one under the female flower much dilated, very narrow under the males. Male flowers very few above the female in the androgynous spikelets, each with 1 or 2 stamens, more numerous with 3 stamens each in the male spikelets. Nut ovoid or globular, 3-ribbed, more or less tuberculate or granular, tipped with the short base of the style. Disk with 8 broad spreading membranous obtuse or truncate lobes, and often shortly aristate within or below the lobes or both.—Boeckl. in *Linnaea*, xxxviii. 458; F. v. M. *Fragm.* ix. 21; *S. distans*, R. Br. *Prod.* 240, not of Poir.

Hab.: Rockhampton, *O'Shaughy* and others; Nerkoal and Herbert's Creeks, *Bourman*; Oxley's Station, *Leichhardt*; Dawson and Burnett Rivers, *F. v. Mueller*.

6. *S. lithosperma* (nut stone-like), *Willd. Kunth, Enum.* ii. 349; *Benth. Fl. Austr.* vii. 429. Stems slender, 1 to 1½ ft. high. Leaves very narrow-linear and rather long, sometimes almost filiform, sheaths acutely 3-angled, usually pubescent on the sides and slightly fringed at the orifice, the upper ones passing into distant leafy bracts gradually shorter and more subulate. Peduncles axillary and terminal, the lowest often much elongated, the upper ones very short, each bearing 1 to 4 clusters of 2 or 3 spikelets or the upper spikelet sessile and solitary within the bract. Spikelets 1½ to 2 lines long, more or less androgynous or male. Outer glumes spreading, acuminate, 2 empty, the third broader with a female flower and above it several sometimes numerous narrower glumes with 1 or 2 stamens in each; in the male spikelets the glumes and flowers more numerous and the stamens often 3. Nut ovoid, smooth and shining or rarely slightly tuberculate. Outer persistent disk broadly cupular, entire, inner adnate one reduced to a brown ring or quite obsolete.—Boeckl. in *Linnaea*, xxxviii. 451; F. v. M. *Fragm.* ix. 21; *S. capillaris*, R. Br. *Prod.* 240; *Kunth, Enum.* ii. 349; *Hypoporum capillare*, *Nees* in *Linnaea*, ix. 308; *Il. Sieberi*, *Nees* in *Sieb. Agrostoth.* n. 97.

Var. *linearis*. Leaves rather broader, inflorescence more branched with more numerous spikelets, but the structure and disk the same.

Hab.: Brisbane River, *F. v. Mueller*.

The species is widely spread over tropical Asia, the var. *linearis* corresponds nearly to Thwaites' var. 2 from Ceylon or Boeckler's var. n. 1.

7. *S. tessellata* (tessellated), *Willd.*; *Kunth, Enum.* ii. 348; *Benth. Fl. Austr.* vii. 430. Stems 1 to 2½ ft. high, rather slender. Leaves mostly 2 to 3 lines broad, the sheaths acutely 3-angled and sometimes narrowly winged, quite glabrous, produced into a short rounded glabrous or shortly ciliate membrane or ligula. Panicles axillary or terminal, the terminal one narrow, 1 or 2 in. long with few erect branches, the axillary ones few, small, distant, pedunculate, the subtending bracts leaflike. Spikelets not numerous, unisexual. Males narrow, fully 2 lines long, with numerous flowers. Glumes narrow, obtuse, closely

enveloping each other, 2 or 3 outer ones empty or rather shorter. Stamens 3. Flowering glume of the female spikelets broad, almost acute, 2 or 3 outer empty ones shorter, and 1 or 2 small narrow empty ones above the flower. Nut white, tuberculate or reticulate and sometimes slightly pubescent. Disk adnate, with very short broad obtuse lobes, the outer persistent one only slightly prominent, or rarely broader and somewhat cupular.—Bœckel. in *Linnaea*, xxxviii. 470.

Hab.: Brisbane River, *F. v. Mueller*.

Var. *debilis*. Stems weak and slender. Leaves narrow. Panicles small, on long peduncles.

Hab.: Rockingham Bay, *Dallachy*.

The species is widely spread over tropical Asia.

8. *S. margaritifera* (pearl-bearing), *Willd.*; *Kunth, Enum. ii. 841*; *Benth. Fl. Austr. vii. 480*. Stems stout, 2 to 3 ft. high, the angles and margins of the leaves scabrous, otherwise glabrous. Leaves long, 3 to 5 lines broad, the sheaths acutely 3-angled but not winged; in the upper part of the stem 2 or 3 leaves often close together, the others distant, the floral ones or leafy bracts gradually smaller. Panicles axillary and terminal, loosely pyramidal, 2 to 3 in. long, forming a narrow leafy interrupted panicle of 1 ft. or more. Inner bracts small. Spikelets scarcely $1\frac{1}{2}$ line long, unisexual, singly sessile along the branches, the females usually nearer the base, the males many-flowered. Stamens 2 or 3. Nut nearly globular, white, smooth and shining or slightly reticulate. Disk adnate, with 3 broad obtuse lobes, the outer one not prominent.—*R. Br. Prod. 240*; Bœckel. in *Linnaea*, xxxviii. 511; *F. v. M. Fragm. ix. 21*.

Hab.: Endeavour River and Bay of Inlets, *Banks and Solander*; Rockhampton, *Thozet*; Fitzroy Island, *Walter*.

The species is also in the Pacific Islands.

9. *S. Græffiana* (after —. Græff), *Bœckel in Flora, 1875, 121* (from the char. given); *Benth. Fl. Austr. vii. 481*. Stature and habit of *S. margaritifera*, the leaves similarly collected 2 or 3 together in the upper part of the stem and the sheaths not winged, but the leaves longer and narrower and as well as the angles of the stem quite smooth or scarcely scabrous. Panicles ovate-pyramidal, dense or rather loose, the terminal one 2 or 3 in. long, and 2 or 3 distant axillary ones smaller. Outer bracts leaflike; inner ones not exceeding the spikelets or here and there a subulate one rather longer. Spikelets numerous, unisexual, the males about 2 lines long. Stamens usually 2. Nut globular, white, tubercular-rugose or nearly smooth, glabrous or sparingly pubescent. Outer persistent disk at length almost cupular, inner adnate disk with 3 broad lobes denticulate at the end.

Hab.: Cape York, *McGillivray*; Cape Grafton, *A. Cunningham*; Mackay, *Amalia Dietrich*.

10. *S. hebecarpa* (fruit downy), *Nees*; *Kunth, Enum. ii. 857*; *Benth. Fl. Austr. vii. 481*. Stems 1 to 3 ft. high, glabrous as well as the foliage. Leaves 2 to 3 lines broad, the sheaths more or less winged on the angles. Terminal panicle $1\frac{1}{2}$ to 3 in. long, not much branched, with 1 or sometimes 2 leafy bracts and a second smaller panicle on a long peduncle in the axil of a leaf much lower down. Inner bracts small and subulate. Spikelets usually 3 together in little cymes or clusters, 2 male and 1 female, the males narrow, under 2 lines long, with numerous flowers. Stamens 3. Flowering glumes of the females very broad, about 1 line long, with 2 or 3 outer empty ones. Nut globular or ovoid, white, smooth and shining but pubescent, under 1 line long. Disk adnate with 3 acute lobes.—Bœckel. in *Linnaea*, xxxviii. 478; *F. v. M. Fragm. ix. 21*; *S. Dietrichia*, Bœckel. in *Flora, 1875, 121* (from the char. given).

Hab.: Wide Bay, *Bidwill*; Rockingham Bay, *Dallachy*.

Widely spread over tropical Asia.

11. **S. chinensis** (of China), *Kunth, Enum. ii. 557*; *Benth. Fl. Austr. vii. 481*. Stems 2 to 8ft. high, glabrous as well as the foliage. Leaves 2 to 5 lines broad, the sheaths more or less winged on the angles, the ligula membranous, often 3 to 5 lines long, but on other leaves short. Terminal panicle dense, much branched, 2 to 4in. long, and 1 or 2 smaller axillary ones lower down. Outer bracts or floral leaves long and leaflike and numerous subulate acuminate bracts within the panicle protruding far beyond the spikelets. Spikelets numerous and crowded, unisexual, usually 1 female and 1 or 2 males in each cluster, the males narrow, about 2 lines long, the females with much broader glumes. Nut globular, white; regularly tuberculate-rugose and sometimes sparingly pubescent. Disk adnate, with 3 broad lobes from very obtuse to almost acute; outer disk scarcely prominent.—*Bœckel. in Linnæa, xxxviii. 486*; *F. v. M. Fragm. ix. 20*.

Hab.: Rockingham Bay, *Dallachy*; Dunk and Gould Islands, *M'Gillivray*; Lower Herbert River, *Herb. F. Mueller*.

Also in the Malayan Archipelago and South China.

12. **S. sphacelata** (withered), *F. v. M. Fragm. ix. 20*; *Benth. Fl. Austr. vii. 482*. Stems $1\frac{1}{2}$ to 3ft. high, glabrous as well as the foliage. Leaves long and narrow, the recurved margins and keel scabrous, the sheaths acutely 3-angled but not winged, and no ligula. Panicles numerous, 1 to near 2in. long, terminal and in the upper axils, the lower ones pedunculate and distant, the spikelets in the male plant very numerous and densely clustered on the short branches of the partial panicles, rather less numerous but still clustered in the female. Outer bracts or floral leaves long and distant, the upper ones gradually shorter and more approximate. Spikelets scarcely 2 lines long. Glumes in the males numerous, obtuse or nearly so, 3 or 4 outer empty ones more acute or acuminate, with dark brown margins and keels or brown all over. Stamens 3. Female spikelets rather larger, with 3 or 4 acute or acuminate glumes, and no empty ones above the flower. Nut globular, tuberculate, more or less pubescent. Disk with 3 very broad spreading membranous truncate lobes.

Hab.: Suttor River, *F. v. Mueller*; Rockingham Bay, *Dallachy*; Rockhampton, *O'Shanesy*, Thozet and others; Springsure Cliffs, *Wuth*; Brisbane River, *Bailey*; Archer's Creek, *Leichhardt*.

Very different in aspect as well as in character from other species.

26. CAREX, Linn.

(From *keira*, to cut, the leaves of some species having their margins minutely serrated.)

Flowers unisexual, in unisexual or androgynous spikelets. Glumes imbricate all round the rhachis. Stamens in the males 3 or rarely fewer, without hypogynous bristles or scales. Ovary in the females enclosed in a bottle-shaped or inflated utricle or perigynium, contracted at the top, with a small oblique or 2-toothed orifice, and at the base of the ovary within the utricle is often a bristle (a barren pedicel) usually very small, not hooked, rarely protruding from the utricle and entirely wanting in many species. Style protruding with 2 or 3 filiform stigmatic branches. Nut flattened or 3-angled, enclosed in the somewhat enlarged persistent utricle.—Perennials with grass-like leaves, mostly radical or on the lower part of the stem. Spikelets either solitary and terminal or few, one terminal the others more or less distant, sessile or pedunculate, or many in a terminal panicle or compound spike. Male flowers collected together in the terminal spikelet or at the upper end rarely at the lower end of the androgynous spikelets. Floral bracts often leaflike under the lower spikelets or branches of the panicle, usually small and glume-like under the upper one, and sometimes under all.

This genus, the largest among Cyperaceæ, is abundant in the temperate and cooler regions of both hemispheres and in mountainous districts within the tropics, with a few species even in the hotter regions.

Spikelets usually few, androgynous, in a short terminal spike. Style-branches 2.

Spikelets 3 to 5, ovate, green or pale-coloured, male at the base or sometimes wholly female.

Outer bract much longer than the inflorescence 1. *C. inversa*.

Spikelets 6 to 12, male at the top, the spike sometimes compound at the base 2. *C. chlorantha*.

Spikelets numerous, androgynous, in a long narrow panicle.

Panicle very narrow and spikelike, the partial spikelike branches short and erect. Style-branches 2.

Stem 3-angled. Utricle ciliate on the angles, with a very short beak 3. *C. paniculata*.

Stem 3-angled. Utricle not ciliate, with a long beak 4. *C. declinata*.

Panicle narrow but loose, the short branches spreading. Style-branches 3 5. *C. fistilis*.

Panicle loose. Spikelets not so numerous as in the preceding species and $\frac{1}{2}$ to $\frac{3}{4}$ in. long. Style-branches 2 6. *C. gracilis*.

Spikelets 3 to 6 or rarely more, the terminal one male, the lower ones female or shortly male at the top and distant. Style-branches 2.

Spikeless all sessile or the lowest scarcely pedunculate.

Glumes mostly obtuse. Spikelets under 2 in.

Spikelets pale-coloured. Utricle abruptly contracted into a short truncate beak 7. *C. contracta*.

Spikelets dark-coloured. Utricle not beaked or tapering into a short beak 8. *C. vulgaris*.

Glume acute. Spikelets mostly above 2 in. 9. *C. acuta*.

Spikelets all pedunculate, narrow, dark-brown 10. *C. lobolepis*.

Spikelets 3 to 6 or rarely more, the terminal one male or female at the top, the lower ones chiefly female and sessile or the lowest shortly pedunculate. Style-branches 8.

Terminal spikelet male, cylindrical. Female ones oblong or cylindrical, distant.

Stems 3 to 8 in. Leaves usually longer, tufted. Female spikelets mostly with a few males at the base.

Utricles corky, ovoid, with short beaks, $\frac{3}{4}$ lines long 11. *C. pumila*.

Utricles not corky, ovoid, with short beaks, $1\frac{1}{4}$ line long 12. *C. brevicornis*.

Spikelets several, cylindrical, the terminal male, the lower ones females or chiefly so and mostly pedunculate. Style-branches 3. Stems tall.

Utricle ovoid, usually dark-coloured, scarcely beaked, very prominently many-nerved.

Glumes ovate or oblong, obtuse 13. *C. maculata*.

Glumes narrow, acute or with long points 14. *C. Brownii*.

Utricle tapering into a distinct beak. Peduncles usually long.

Spikelets erect or scarcely spreading, usually 2 or more from the same sheath. Glumes rather broad, acuminate or aristate 15. *C. longifolia*.

Spikelets spreading or pendulous. Glumes and utricles tapering into long points 16. *C. pseudocyperus*.

1. ***C. inversa*** (inversed), *R. Br. Prod.* 242; *Benth. Fl. Austr.* vii. 488. Stems in the typical form from a few in. to above 1 ft. high. Leaves shorter, narrow. Spikelets 3 to 5, all sessile in a terminal cluster or short spike, rarely reduced to a single one, or with an additional axillary one rather lower down, all usually androgynous, ovate, 8 to 6 lines long. Outer leaflike bracts 1 to 8, longer than the inflorescence. Glumes very thin and almost hyaline, with a green 1 or 3-nerved keel. Male flowers at the base of the spikelet sometimes numerous occupying half the spikelets, more frequently few only and sometimes quite deficient, rarely 1 or 2 males at the end of the spikelet. Female flowers usually rather numerous. Utricle much flattened, $1\frac{1}{2}$ to 2 lines long including the beak, ovate or obovate, several-nerved, with green ciliate edges, tapering into a bifid beak short in the typical form, nearly as long as the utricule in the larger variety. Style-branches 2. Nut much flattened, nearly sessile.—*Boott, Ill. Car.* iv. 151, t. 486 to 488; *Hook. f. Fl. Tasm.* ii. 99; *Boeckl. in Linnæa*, xxxix. 69; *F. v. M. Fragm.* viii. 252.

Hab.: Brisbane and Dawson Rivers, *F. v. Mueller*, Rockhampton, O'Shanesy; Rockingham Bay, *Dallachy*.

Var. *major*. Stems 1½ to 2½ ft. high. Utricle 2 lines long, prominently nerved, with a long beak.

Hab.: Brisbane River, *F. v. Mueller*.

The species is also in New Zealand.

2. *C. chlorantha* (flowers green), *R. Br. Prod.* 242; *Benth. Fl. Austr.* vii. 440. Stems usually under 6 in. but sometimes above 1 ft. Leaves much shorter. Spikelets 6 to 12 sessile in a dense terminal spike of ½ to 1 in. or rarely rather longer and interrupted at the base, and then slightly compound with more numerous spikelets, the spikelets all or mostly androgynous, ovoid-oblong, 2 to 3 lines long, usually brown. Outer bracts glume-like or rarely the lowest with a subulate lamina nearly as long as the inflorescence. Glume ovate, 1 to 1½ line long, acute or mucronate, the keel usually green. Male flowers few at the top of the spikelet. Utricle as long as the glume, much flattened, the edges ciliate tapering into a 2-toothed beak. Style-branches 2. Nut flat.—*Hook. f. Fl. Tasm.* ii. 99, t. 150; *Boott, Ill. Car.* iv. 171, t. 580, B; *F. v. M. Fragm.* viii. 256.

Hab.: Queensland border of N.S.W., *F. v. M.*

3. *C. paniculata* (paniculate), *Linn.*; *Kunth, Enum.* ii. 389; *Benth. Fl. Austr.* vii. 440. Stems attaining several ft., 8-angled and often very acutely so, or when old more striate with the angles less prominent. Leaves varying from 1 to 4 lines broad, the margins very scabrous. Spikelets androgynous, very numerous in a narrow spike-like panicle, usually 8 to 6 in. long, but sometimes much longer and interrupted at the base, with short erect branches or sessile partial spikes, or occasionally almost reduced to that of the compound variety of *C. chlorantha*. Bract at the base of the panicle small and subulate or obsolete. Spikelets varying from ovoid and scarcely 2 lines to lanceolate and 3 lines long, usually brown. Male flowers sometimes numerous occupying at least the upper half, sometimes few only. Glumes ovate, with short points. Utricle much flattened, ovate, many-nerved, the margins more or less ciliate or denticulate, contracted into a short 2-toothed beak. Style-branches 2.—*Reichb. Ic. Fl. Germ.* t. 228; *C. appressa*, *R. Br. Prod.* 242; *Sieb. Agrostoth.* n. 15; *Nees in Pl. Preiss.* ii. 94; *Hook. f. Fl. Tasm.* ii. 99; *Boott, Ill. Car.* i. 46, t. 119, 120; *Bœckel. in Linnæa*, xxxix. 99; *C. virgata*, *Soland.*; *Boott, l.c.* t. 121, 122, *Bœckel. l.c.* 98; *C. halmaturina*, *Bœckel. l.c.* 100, partly.

Hab.: Rockhampton, *O'Shanesy* and others.

Var. *subdiaphana*. Leaves very long and glumes pale as in *C. declinata*, but the utricles broad and ciliate as in *C. paniculata*.

Hab.: Rockhampton, *Thozet*.

4. *C. declinata* (curved downwards), *Boott, Ill. Car.* iv. 171, t. 580; *Benth. Austr.* vii. 441. Very closely allied to *C. paniculata*, with the same triquetrous stems, scabrous foliage, inflorescence and short androgynous spikelets male at the top, but the glumes are more membranous, almost white, and the utricles narrower, much less flattened, tapering into a long beak, neither ciliate nor denticulate. Leaves often longer than the stem.—*F. v. M. Fragm.* viii. 257.

Hab.: Brisbane River, *F. v. Mueller, Bailey*.

5. *C. fissilis* (split), *Boott, Ill. Car.* ii. 86, t. 245; *Benth. Fl. Austr.* vii. 441. Stems 2 ft. high or more. Leaves long, 3 to 4 lines broad. Bracts at the base of the lower branches of the panicle leaflike. Panicle narrow, loose and compound, 6 to 8 in. long, consisting of 1 terminal and 3 or 4 distant partial panicles, often 2 together from the axil of the same leafy bract, all narrow pyramidal, the rachis ciliate on the angles. Spikelets numerous, sessile along the smaller branches but not crowded, 3 to 5 lines long, androgynous, with rather numerous male flowers at the top and usually 3 or 4 females at the base.

Glumes membranous, ovate or lanceolate, more or less aristate, the males narrower, and 1 or 2 empty glumes at the base of the spikelet. Utricle narrow, curved, prominently striate, $1\frac{1}{2}$ to $1\frac{1}{4}$ line long including the long acuminate beak. Style-branches 8.—*C. indica*, F. v. M. but scarcely of Linn.

Hab.: Rockingham Bay, *Dallachy*, and other northern localities.

The species is also in *Aneiteuma* (New Caledonia) whence were the specimens described and figured by Boott.

C. Dietrichæ, Boeckl. in Flora, 1875, 122, from Mackay, *Amalia Dietrich*, is from the character given, probably the same species.

6. *C. gracilis* (slender), *R. Br. Prod.* 242; *Benth. Fl. Austr.* vii. 442. Stems slender, 1 to 2ft. high. Leaves long and narrow. Spikelets rather numerous but narrow and $\frac{1}{2}$ to $\frac{3}{4}$ in. long, erect or scarcely spreading in a narrow simple panicle, mostly androgynous, male at the top, shortly pedunculate and clustered 2 or 8 together, the floral bracts short and subulate, or the lowest much lower down and leaflike with 2 longer peduncles in its axil, one of them bearing 2 or 3 spikelets. Glumes lanceolate or ovate-lanceolate, acute acuminate or shortly aristate. Utricle almost sessile, flattened, ovate, very prominently many-nerved, pubescent, with a long beak.—Boott, Ill. Car. i. 59, t. 151, 155; F. v. M. *Fragm.* viii. 250

Hab.: Brisbane River, *Bailey*.

7. *C. contracta* (contracted), F. v. M. *Fragm.* viii. 258; *Benth. Fl. Austr.* vii. 442. Stems rather slender, 1 to 2ft. long. Leaves long and narrow, the floral leaves or bracts short and subulate or the lowest long and leaflike. Spikelets 8 to 6, all rather distant, erect and sessile, or the lowest shortly pedunculate, the terminal one male, slender, 1 to 2in. long, the others usually shorter, female or rarely with a few male flowers at the top. Glumes narrow, obtuse or almost acute, thin and brown or hyaline, with a green centre or midrib. Utricle much flattened, with nerve-like margins, ovate or elliptical, about $1\frac{1}{2}$ line long, shortly stipitate and contracted into a very short truncate or scarcely 2-toothed beak, with 8 or 4 prominent nerves on each face. Style-branches 2. Nut flat, nearly orbicular, much shorter than the utricle.

Hab.: Stanthorpe to Wallangarra.

This species should probably be better placed as a form of *C. vulgaris*, from the Queensland form of which it seems principally to differ in its pale glumes and scabrous stems.

8. *C. vulgaris* (common), *Fries, var. Gaudichaudiana*, Boott, Ill. Car. iv. 169, t. 567; *Benth. Fl. Austr.* vii. 442. Stems tufted or emitting creeping stolones, from a few in. to 2 or 8ft. high. Leaves often longer than the stem and usually narrow, the outer sheaths usually without blades and sometimes split up into filaments. Spikelets 8 to 5, rarely more or fewer, all sessile or the lowest scarcely pedunculate and erect, varying from $\frac{1}{2}$ to $1\frac{1}{4}$ in. long, near together or more frequently rather distant, the terminal one and sometimes a second smaller one immediately under it male, the others female or sometimes with a few male flowers at the top. Glumes dark-brown or black, obtuse or very shortly mucronate, often with a green midrib. Utricle very flat, from orbicular to ovate, usually longer than the glume, more or less distinctly several-nerved, obtuse acute or tapering into a short beak. Style-branches 2.—F. v. M. *Fragm.* viii. 257; *C. Gaudichaudiana*, Kunth, Enum. ii. 417; Hook. f. *Fl. Tasman.* ii. 99, t. 151 A; *C. cespitosa*, *R. Br. Prod.* 242, and of most early authors.

Hab.: Brisbane River, *Bailey*.

The species is abundant and widely spread over the temperate regions of the northern hemisphere. Its numerous varieties have been detailed at considerable length by Boott, l.c. The Australian form which is also in New Zealand, though correctly reduced by Boott to the comprehensive *C. vulgaris*, Fries, appears to me nevertheless to be quite as distinct from some of its northern forms as they are from the special Scandinavian form to which Fries would limit

the *C. cæspitosa*, Linn., and after much examination and comparison I cannot refrain from the conclusion I had formerly come to to that the whole, after Goodenough and B. Brown and other older authors, ought to be reunited under the Linnean name of *C. cæspitosa*.—Benth.

9. *C. acuta* (acute), Linn.: Kunth, *Enum.* ii. 412; Benth. *Fl. Austr.* vii. 448. A tall species, very closely allied to the larger varieties of *C. vulgaris*, the spikelets usually longer and more numerous and the glumes narrow and acute or short and aristate. Stems attaining several feet. Leaves longer and rather broad, the lower floral ones or leafy bracts often longer than the inflorescence. Spikelets narrow, $1\frac{1}{2}$ to 4 in. long, 1 to 4 upper ones male and near together, 3 to 5 lower ones more distant and female or the upper ones with a few male flowers at the top, all erect and sessile or the lower ones shortly pedunculate. Glumes oblong-lanceolate or linear or short and tapering to a fine point, dark with a light-coloured midrib unless when very narrow, the females more acute or aristate than the males. Utricle very flat, varying as in *C. vulgaris* from ovate and obtuse to ovate-elliptical and very shortly beaked, more or less distinctly several-nerved.—Boott, Ill. Car. iv. 165, t. 548 to 556; F. v. M. *Fragm.* viii. 259; *C. Cunninghamii*, Boott, Ill. Car. iv. 171, t. 579; *C. polyantha*, F. v. M. in *Trans. Phil. Soc. Viet.* i. 110, and in *Hook. Kew. Journ.* viii. 384.

Hab.: Moreton Bay, Leichhardt.

The species is spread over Europe, Northern Asia and North America.

10. *C. lobeolepis* (scales lobed), F. v. M. *Fragm.* viii. 258; Benth. *Fl. Austr.* vii. 448. Stems 1 to 2 ft. high, slender but rigid. Leaves sometimes as long, the sheaths bordered by a scarious membrane at length torn into shreds. Lower floral leaves or bracts longer than the inflorescence, with very short sheaths. Spikelets 4 to 6, cylindrical, narrow, $1\frac{1}{2}$ to nearly 2 in. long, the terminal one male or with a few female flowers at the top the others female or with a few males at the top or at the base, all pedunculate, at first erect, but spreading or pendulous when in fruit. Glumes a rich brown, obtuse, emarginate or shortly 2-lobed, the prominent midrib often produced into a short point. Utricle sessile, ovate, flat, rather acute but not beaked, faintly several-nerved. Style branches 2.

Hab.: Border of N.S.W., near Wallangarra.

11. *C. pumila* (dwarf), Thunb.; Boott, Ill. Car. iv. 217; Benth. *Fl. Austr.* vii. 445. Rhizome often creeping in the sands to a great extent. Stems 4 to 8 in. high. Leaves much longer, more rigid than in *C. breviculmis*, tapering into long subulate points. Spikelets 3 to 6, the terminal one male, narrow, $\frac{3}{4}$ to rather above 1 in. long with often 1 or 2 smaller male ones immediately below it, the lower ones female or with a few male flowers at the top, distant, sessile or the lowest shortly pedunculate, $\frac{1}{2}$ to $\frac{3}{4}$ in. long. Lower outer bracts leaflike and sometimes very long, the upper ones subulate or small. Glumes at the time of flowering ovate-oblong or lanceolate, usually purple, with scarious or hyaline margins, the keel prominent and more or less produced into a point, often enlarged under the fruit brown and acuminate. Utricle larger than in the allied species and of a thick corky substance, ovoid, nearly 3 lines long, shortly contracted at the base, faintly-nerved, tapering into a short bifid beak. Style-branches 3.—F. v. M. *Fragm.* viii. 251; *C. littorea*, Labill. *Pl. Nov. Holl.* ii. 69, t. 219; R. Br. *Prod.* 243; Hook. f. *Fl. Tasm.* ii. 100.

Hab.: Moreton Island, McGillivray, F. v. Mueller.

Also in New Zealand, along the eastern coasts of Asia and in extratropical South America.

12. *C. breviculmis* (stem short), R. Br. *Prod.* 242; Benth. *Fl. Austr.* vii. 445. Stems usually only a few inches high but sometimes 1 ft. or more. Leaves usually longer than the stem, the lower floral bracts often very long and narrow, the upper ones or very rarely all short and subulate. Spikelets 2 to 5, narrow-

cylindrical, mostly about $\frac{1}{2}$ in. long and rather loose; the terminal one male, the lower ones female or 1 or more of them with male flowers in the upper half, all erect and sessile or the lowest shortly pedunculate, distant or the upper ones crowded together. Glumes loosely imbricate, thinly membranous, the females with a prominent keel produced into a fine point, the males obtuse or shortly mucronate. Utricle shortly stipitate, ovoid, usually longer than the glume but shorter than its point, very faintly or more distinctly many-nerved, glabrous or minutely pubescent, with a rather long conical beak. Style-branches 3.—Boott, Ill. Car. iv. 181; Hook. f. Fl. Tasm. ii. 101, Fl. Nov. Zel. t. 63; F. v. M. Fragm. viii. 255; *C. Royleana*, Boott, Ill. Car. i. 6, t. 19.

Hab.: Brisbane River, Dr. Chas. Prentice.

Also in New Zealand, the Himalaya and Japan.

18. *C. maculata* (spotted), Boott in Trans. Linn. Soc. xx. 128; Ill. Car. i. 9, t. 26; Benth. Fl. Austr. vii. 447. Stems long and weak. Leaves long, the floral ones or outer bracts exceeding the inflorescence, the sheaths bordered by a broad thinly scarious brown membrane. Spikelets several, 3 or 4 usually sessile in a terminal cluster, of which 1 wholly male and 1 to 3 androgynous the male flowers at the top, and 2 to 4 females more or less distant and pedunculate, the lowest often far down on a long slender peduncle, but all erect, cylindrical, mostly about 1 in. long. Glumes ovate or oblong, obtuse or scarcely mucronate, thinly scarious, pale brown or hyaline. Utricles sessile, ovoid, often compressed, rather acute or very shortly beaked, longer than the glume, very prominently several-nerved. Style-branches 3. Nut 3-angled.—*C. neurochlamys*, F. v. M. Fragm. viii. 258.

Hab.: Brisbane River, Moreton Bay, F. v. Mueller, C. Stuart, Bailey; Rockingham Bay, Dallachy.

Also in East India, as identified by Boott.

14. *C. Brownii* (after Dr. R. Brown), Tuckerm. Enum. Car. 21; Benth. Fl. Austr. vii. 447. Stems 1 to 2 ft. long, rather weak. Leaves long, the lowest floral ones or outer bracts often exceeding the inflorescence, the upper ones short and subulate. Spikelets usually 3 or 4, very near together at the end of the stem, erect and sessile or nearly so, but sometimes the lowest more distant and more or less pedunculate, the terminal one male, the others female all $\frac{3}{4}$ to 1 in. long. Glumes more or less scarious, narrow or short and acuminate, the midrib produced into a rather long point. Utricle ovoid, turgid or nearly globular, usually dark-coloured in fruit, rather more than 1 line long, prominently many-nerved, abruptly contracted into a very short 2-toothed beak. Style-branches 3.—Boott, Ill. Car. iv. 161, t. 592, F. v. M. Fragm. viii. 250; *C. striata*, R. Br. Prod. 248, Kunth, Enum. ii. 458, Sieb. Agrostoth. n. 16, not of Michaux.

Hab.: Southern localities.

C. lacistoma, R. Br. Prod. 243; Boott, Ill. Car. t. 532, appears to have been correctly referred by F. v. Mueller; to *C. Brownii*, Benth.

15. *C. longifolia* (leaves long), R. Br. Prod. 242; Benth. Fl. Austr. vii. 448. Stems 2 to 8 ft. high, with long rather broad leaves, the lower floral ones or outer bracts long and leaflike, with long sheaths. Spikelets 6 to 20, the terminal one male, 1 to 1 $\frac{1}{2}$ in. long, often accompanied by a cluster of shorter ones all male or partially female, the others all pedunculate and female or with a few male flowers at the base or at the top, 1 to 2 in. long, the peduncles slender and usually clustered 2 to 4 together in the axils of the long leaflike outer bracts or floral leaves, the sheaths of the lower ones long. Glumes scarious, rather broad, acuminate or obtuse and aristate, the keel usually prominent. Utricles oblong-elliptical, stipitate, prominently 3-angled, tapering into an entire or 2-toothed beak, nearly 3 lines long including the beak. Style-branches 3. Nut short,

prominently 8-angled.—Boott, Ill. Car. iii. 108, t. 381, 382; Sieb. Agrostoth. n. 14; Hook. f. Fl. Tasm. ii. 101; F. v. M. Fragm. viii. 250; *C. Brecknei*, Steud. Syn. Glum. ii. 209.

Hab.: Upper Brisbane River, *F. v. Mueller*.

16. *C. pseudocyperus* (false Cyperus), Linn.; Kunth, Enum. ii. 501; Benth. Fl. Austr. vii. 448. Stems stout, angular, 2 to 8ft. high. Leaves long, 2 to 5 lines broad. Spikelets 2 to 5, all pedunculate and at length pedulous, but usually near together at the end of the stem, cylindrical, 1 to 2in. long, the terminal one male the others female. Outer bracts long and leaflike. Glumes very shortly ovate or lanceolate, tapering into fine points. Utricles when ripe very spreading or reflexed, ovoid-oblong at the base, strongly nerved and tapering into a long rigidly acuminate 2-cleft beak, the whole utricle including the beak varying from 2 to 3 lines, on a very short stipes.—R. Br. Prod. 243; F. v. M. Fragm. viii. 249; *C. fascicularis*, Soland.; Boott, Ill. Car. i. 58, t. 189; Hook. f. Fl. Tasm. ii. 101.

Hab.: Boyne River, Hartmann; Stradbroke Island, Bailey.

ORDER CLIII. GRAMINEÆ.

Flowers hermaphrodite or unisexual, in little green or more or less scarious spikes called *spikelets*, consisting of several scale-like distichous bracts called *glumes*, the 2 or sometimes 1 or rarely 3 or more lower ones with sometimes 1 or more upper ones empty, the other 1 or more with 1 sessile flower in the axil of each. No normal perianth, but the flower usually enclosed in a 2-nerved glume-like scale called a *palea* (supposed to represent the 2 bracteoles of Hypolytræ or the perigynium of Caricæ), and the perianth probably represented by 2 or rarely 3 small usually very thin and hyaline scales called *lodicules*, the palea or the lodicules, or both deficient in a few genera. Stamens usually 3, occasionally reduced to 2 or 1, in a few genera 6 or more; filaments free, filiform; anthers usually exserted from the spikelet, versatile, ovate oblong or linear, with 2 parallel cells opening longitudinally without any prominent connective. Ovary entire, 1-celled, with 1 erect anatropous ovule. Styles 2 or rarely 3, free or united at the base into a 2 or 3-branched style, the upper stigmatic portion or *stigma* usually long, either feathery with simple or branched stigmatic hairs, or more rarely simple with the stigmatic hairs very short or reduced to scarcely prominent papilla. Fruit a small seed-like nut or utricle, often enclosed in the palea and subtending glume, the thin membranous pericarp usually closely adnate to the seed and inseparable from it, sometimes adnate also to the enclosing palea, in a few genera free and loosely surrounding the seed. Seed erect, albuminous, with a thin adnate testa. Embryo small, usually globular or nearly so, on one side of the base of the albumen.—Herbs usually tufted or decumbent or creeping and rooting as the base, sometimes tall and branching, or in some shrubby or arborescent. Stems usually hollow between the nodes. Leaves alternate, entire parallel-veined, usually long and narrow, sheathing the stem at their base, but the sheaths split open from the base opposite the blade and often ending within the blade in a transverse scarious or ciliate appendage called a *ligula*. Inflorescence terminal, rarely also from the sheaths of the upper leaves, the spikelets variously arranged in spikes, racemes, panicles or heads. Bracts occasionally but rarely subtending the branches of the panicle or single spikelets.

A very large Order, abundantly diffused over the whole world, in almost every variety of station, and supplying many of the most important articles of food and raiment, or applied to a great variety of economical purposes.

For the arrangement of the Tribes and Sub-tribes I have followed that of Hooker in the vii. vol. of the Fl. of British India.

SERIES A. Panicaceæ.—*Spikelets articulate on their pedicels, or deciduous with them, 1 to 2-flowered, upper flower alone (if 2) fruiting.*

(*Spikelets on their pedicels in a few genera.*)

1. Rhachis of inflorescence articulate or sub-articulate in *Stenotaphrum*. Flower glumes usually coriaceous or herbaceous.

TRIBE I. Panicæ.—*Spikelets 2-flowered, upper flower bisexual, lower male or neuter, rarely both fertile (Spinifex is dioecious).*

* *Spikelets articulate on their pedicels, except in Isachne and Arundinella.*

† *Spikelets not involuclerate by bristles.*

§ *Spikelets not awned (2nd and 3rd glumes beaked or awned in Panicum crus-galli) see also Tricholæna and Arundinella).*

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| Spikelets dorsally flattened, base not thickened; glumes 3 | 1. PASPALUM. |
| Spikelets with a callous annulus or cup at the base | 2. ERIOCHLOA. |
| Spikelets sub-globose, paniculate; glumes 4, 1st and 2nd separately deciduous, subequal | 3. ISACHNE. |
| Spikelets paniculate or spicate; glumes 4, 1st and 2nd very rarely subequal, 2nd and 3rd awned in <i>P. crus-galli</i> , 4th rarely very shortly awned | 4. PANICUM. |
| Spikelets of <i>Panicum</i> , but the 4th glume narrowed into a short flattened stipes, or with 2 appendages near the base | 5. ICHNANTHUS. |
| Spikelets paniculate, branches of panicle produced beyond the uppermost spikelet; 1st glume minute hyaline | 6. CHAMERAPHIS. |
| Dioecious, spikelets in dense heads | 7. SPINIFEX. |

§§ *Spikelets awned, except in some species of Tricholæna and Arundinella.*

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| Spikelets of <i>Panicum</i> , but the nerves of the 2nd glume broadly fimbriate and the palea of 3rd deeply cleft, 4th awned | 8. AXONOPUS. |
| Spikelets silky; 1st glume wanting or minute and distant from the 2nd and 3rd with usually capillary awns | 9. *TRICHOLENA. |
| Spikelets solitary or fasciculate on a simple rhachis or the branches of a panicle; 1st glume long awned | 10. OPLISMENUS. |
| Spikelets persistent on the pedicels or the 1st and 2nd glumes separately deciduous, 4th deciduous; usually awned, awn bent | 11. ARUNDINELLA. |
| †† Spikelets each surrounded by an involucre of bristles | 12. SETARIA. |

** *Spikelets persistent on their pedicels, at least the fertile, or deciduous with their pedicels.*

† *Spikelets in involuclerate deciduous fascicles.*

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|---|------------------|
| Involucres of numerous simple or plumose bristles completely surrounding the spikelet | 13. PENNisetum. |
| Involucres of 3 or 4 unilaterally divided branches not completely surrounding the spikelet | 14. PLAGIOSETUM. |
| Involucre of several outer bristles and inner flat lobes completely surrounding 1 to 3 spikelets and at length hardened | 15. CENCHRUS. |
| Spikes of few spikelets enclosed at the base in sheathing bracts | 16. XEROCHLOA. |

†† *Spikelets not involuclerate.*

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|---|--------------------|
| Spikelets 2-seriate on a flat sub-articulate rhachis | 17. *STENOTAPHRUM. |
| Spikelets (at least the fertile) 1-seriate on an inarticulate flat rhachis, the upper ones male, lower female | 18. THUAREA. |

TRIBE II. Oryzæ.—*Spikelets 1-flowered, articulate on their pedicels and deciduous from them. Palea 1 to 3-nerved. Stamens 6 or fewer.*

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|---|----------------|
| Spikelets 2-sexual, awned or not; glumes 4, 1st and 2nd minute or selaceous | 19. ORYZA. |
| Spikelets 2-sexual, awnless, glumes 2, broad, thin | 20. LEERSIA. |
| Spikelets 1-sexual, fruiting glume inflated, leaves broad | 21. LEPTASPIS. |

TRIBE III. Zoysiaæ.—*Spikelets 1-flowered, deciduous with thin pedicels, 2-sexual or some imperfect.*

* *Spikelets fasciculate.*

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| Spikes solitary; fascicles on all sides; 3rd glumes echinate | 22. TRAGUS. |
| Spikes dense, spikelets not awned; glumes 4, the outer one the largest | 23. NEURACHNE. |

** *Spikelets solitary; rarely 2-nate.*

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| Spikes very slender; spikelets narrow; 1st and 2nd awned | 24. PEROTIS. |
| Spike rigid; spikelets appressed to the rhachis, not awned | 25. ZOYSIA. |

TRIBE IV. Andropogones.—Spikelets usually 2-nate, or the terminal in the inflorescence 3-nate, pairs homo or heterogamous. Flowering glume smaller than the empty, hyaline, often awned or reduced to an awn.

SUBTRIBE 1. Maydes.—Spikelets spicate, all 1-sexual; males spikes in terminal panicles, or continuous with the female spike.

- Fruiting spikelets enclosed in a stony, nut-like polished glume 26. *COIX.
 Fruiting spikelets below the males, the glume very hard and smooth 27. POLYTOCA.
 Spikelets 1-seriate 28. *EUCHLÆNA.
 Spikelets many-seriate 29. ZEA.

SUBTRIBE 2. Dimeriæ.—Spikelets homogamous, secund on a slender inarticulate rhachis, 1-flowered, diandrous. 30. DIMERIA.

SUBTRIBE 3. Saccharæ.—Spikelets homogamous, in compound racemes or panicles (except Pollinia); 1st glume not sunk in a hollow of the rhachis,

* Rhachis not or rarely fragile.

- Spikelets in a cylindrical silvery thyrus, 1-flowered, not awned 31. IMPERATA.

** Rhachis fragile.

- Spikelets in geminate digitate of fasciculate spikes 32. POLLINIA.

SUBTRIBE 4. Isachemæ.—Spikelets many, in solitary digitate or fasciculate spikes, usually heteromorphous; 1st glume not sunk in a hollow of the rhachis (see Pollinia in Saccharæ)

* Margins of 1st glume of sessile spikelet inflexed.

- Spikes rarely solitary; spikelets 2-nate, 2-flowered, awned 33. ISACHEMUM.
 Spikes solitary; spikelets 1-flowered, 1st glume pectinate 34. EREMOCLOA.

** Margins of 1st glume of sessile spikelet not inflexed.)

- Spikes solitary; spikelets 2-nate, 1 to 2-flowered, 2-awned 35. POGONATHERUM.
 Spikes 2-nate or digitate; spikelets 1-flowered 36. ARTHAXON.

SUBTRIBE 5. Apludæ.—Spikelets 3 on an inarticulate rhachis. 37. *APLUDA.

SUBTRIBE 6. Rottboelliæ.—Spikelets homo or heterogamous, 1 to 2-flowered, solitary or 2 rarely 3-nate, on the internodes of an articulate spike or raceme, not awned; 1st glume not keeled, adnate to or sunk in a depression formed by the intermode and pedicel of the upper spikelet; glumes of sessile spikelet 4.

- Spikelets 2-nate, 1st glume flat 38. ROTTBOELLIA.
 Spikelets 2-nate, 1st glume globose 39. MAMISURIS.
 Spikelets 2-nate, 1st glume appressed covering the cavity of the rhachis. 40. HEMARTHRIA.
 Spikelets solitary 1st glume convex 41. OPHIURUS.

SUBTRIBE 7. Guandropogones.—Spikelets heterogamous, 1-flowered, 3-rarely 3-nate on the whorled articulate branches of simple or compound racemes or panicles; glumes, 4, 1st not keeled, 4th usually awned.

- Spike densely silky-hairy; first glume of the sessile spikelet 2-lobed; pedicellate spikelet barren 42. ELIONURUS.
 Spike single; spikelets unisexual, the awned females turned to one side; the awnless males imbricate behind them 43. HETEROPOGON.
 Spikes solitary digitate or several nearly sessile on a simple rhachis; sessile spikelet 1-flowered and fertile, pedicellate one male or neuter 44. ANDROPOGON.

* Panicle loose. Fertile spikelets awned.

- 1st glume either membranous or narrow and rigid with 2 prominent often muricate lateral nerves 45. CHRYSOPOGON.
 1st glume when in fruit hard, smooth and shining, ovate or lanceolate 46. SORGHUM.
 Spikelet in 2 superposed series; upper series of heterogamous pairs, and a terminal male, lower a whorl of 4 persistent males or neuter 47. ANTHISTIRIA.
 Spikelets as in Anthistiria, but male and neuter, spikelets deciduous with the female; callous none 48. ISEILENA.

SERIES B. Poacæ.—Spikelets continuous (not articulate with) their pedicels, 1 to many-flowered; rhachilla articulate at the base and often between the flowering glumes; lowest flower always fruiting, upper often male or neuter.

EXCEPTIONS.—Upper flower alone bisexual in Phalaridæ. Spikelets articulate on their pedicels, or 1st and 2nd glumes separately deciduous occur in Alopecurus.

TRIBE V. **Phalaridæ**.—Spikelets with a terminal perfect flower, and one or more imperfect male or neuter below it; rhachilla not produced beyond the perfect flower.

Panicle contracted or spiciform; spikelets awnless; stamens 3 49. *PHALARIS.
 ending in panicles more or less awned. Stamens 4, rarely 2 50. MICROLENA.

Flowering glume **Prostoides**.—Spikelets 1-flowered; rhachilla articulate at the base, provided with the single ~~teeth~~; the flowering glume; glume 3, 1st and 2nd empty, 3rd flowering awned.

SUBTRIBE III. **Elytæ**.—Spikelets paniculate; rhachilla not produced beyond 3rd glume; spike; plane of ~~spikelets~~ rigid or hard, awned.

Spikelets 1-flowered 51. ARISTIDA.

TRIBE XI. **Stipæ**.—Spikelets narrow, awn entire, at length articulate on the glume 52. STIPA.

Spikelets 1-flowered, narrow, awn entire, continuous with the point of the glume 53. STREPTACHNE.

TRIBE 2. **Phleoides**.—Spikelets in spiciform or subspiciform panicles, 3rd glume usually 3-flowered, loosely wrapping the grain; stigmas exerted from the top of the spikelet.

Flowers 54. ALOPECURUS.
 climbed 2nd glumes longer than the 3rd; panicle cylindrical. Rhachilla not produced beyond the flowering glume

SUBTRIBE 3. **Eragrostes**.—Spikelets usually small, in open or contracted many flowered panicles; glumes usually thin or membranous; stigmas laterally exerted from the spikelet, spikelets rarely 2-flowered in Sporobolus.

OR Spikelets 1-flowered, capitate; rhachilla continued in a small bristle; flowering glume 3-lobed, the central lobe awned 55. ECHINOPOGON.

ra Spikelets 1-flowered, capitate; rhachis not produced above the flower; lobes of flowering glumes 3, all with points or awns 56. AMPHIPOGON.

c Spikelets and pedicels inarticulate, 1st and 2nd glumes persistent.
 Glumes all awnless; 1st and 2nd 1-nerved, pericarp of grain loose 57. SPOROBOLUS.

Glumes 1st and 2nd subequal, 1-nerved, awnless, awn of the 3rd dorsal or wanting 58. AGROSTIS.

Rhachilla produced beyond the 3rd glume, usually penicillate with long silky hairs; 1st and 2nd glumes 3-nerved 59. DEYEUXIA.

Rhachilla not produced beyond the flower; awn fine near the tip of the glume. Palea more than $\frac{1}{2}$ as long as the glume 60. DICHELACHNE.

TRIBE VII. **Avenæ**.—Spikelets 2 or more flowered, paniculate very rarely spicate, or panicle subspiciform; flowering glumes usually awned, awn geniculate and often twisted, rarely straight or wanting; rhachilla produced or not beyond the upper flowering glume.

SUBTRIBE 1. **Airæ**.—Spikelets 2-flowered; glumes membranous; rhachilla not produced.

1st glume acute, many-nerved; flowering glume long ciliate 61. ERIACHNE.

Spikelets 2-flowered, fruiting glumes close together, not hardened round the grain 62. MICROIRA.

Spikelets awnless, 3rd glume largest bi-sexual, 4th male 63. CEBLACHNE.

SUBTRIBE 2. **Euavenæ**.—Spikelets 2 or more-flowered; rhachilla produced.

Spikelets 2-flowered, lower flower bisexual awnless, upper male or neuter awned 64. *HOLCUS.

Spikelets 2 to 6-flowered; flowering glumes awned, awn subterminal or dorsal 65. *AVENA.

Spikelets 3 or more-flowered; flowering glume deeply cleft, awned in the cleft 66. DANTEONIA.

Spikelets 1-flowered, large, with long awns; awns 3, central one long twisted and bent 67. ANISPOGON.

TRIBE VIII. **Chloridæ**.—Spikelets 1 or more flowered, 2-seriate (sometimes very distantly) and second on an inarticulate spike or on the spiciform branches of a slender panicle; flowers all or the lower only bisexual; rhachilla produced or not beyond the upper flowering glume.

* Spikes or spiciform-branches digitate; racemose or paniculate (or solitary in Chloris.)

Spikelets 1-flowered, awnless, in digitate spikes, the rhachis of the spikelet not at all or minutely produced above the flower 68. CYNODON.

Spikelets 1-flowered, awned, in a simple or in digitate spikes, with 1 or more empty glumes above the flowering one 69. CHLORIS.

Spikelets several-flowered, sessile in 2 rows on one side of 1 or 2 simple spikes. Lobes of the flowering glumes 3, the central one alone awned 70. ASTRÆA.

Spikelets several-flowered, awnless or with long-pointed glumes, in digitate or scattered spikes. Grain or seed within the pericarp loose and rugose 71. ELEUSINE.

Spikelets several or rarely 1-flowered; awnless in scattered spikes. Grain smooth, the pericarp adnate 72. LEPIDOCLEA.

TRIBE IX. Festuaceæ.—Spikelets 2 or more-flowered, pedicellate, sessile, in effuse or contracted, rarely spiciform, panicles; rhachilla articulate at the base and often at the base of the flowering glume, always produced beyond the uppermost flowering glume.

SUBTRIBE I. Pappophoreæ.—Spikelets few or many-flowered; glumes many-awned or 4 to 5-lobed. flowering glumes many-awned or 4 to 5-lobed.

Spikelets in simple or branched spikes; flowering glume many-awned . . . to our climate.

SUBTRIBE II. Arundinææ.—Spikelets paniculate, 2 to many-flowered; flowers penicillate with long silky hairs on the callus or sides or both, lowest . . . 1 ft. high. sometimes male or neuter.

Rhachilla very short; flowering glumes glabrous, callus with long silky hairs . . . 74. *Phragmites* orifice;

SUBTRIBE III. Sesleriææ.—Spikelets in spiciform panicles, or in spicate clusters with or without imperfect spikelets of imbricating glumes at the base of the spike or of the clusters, 1 or when 8 flowered.

Spikelets very minute, in globose clusters on an elongated simple rhachis . . . 75. *Elytrophora* densely

SUBTRIBE IV. Eragrostææ.—Inflorescence various. Spikelets 2 to many-flowered, a flowering glume 1 to 3-nerved, entire, 3-toothed, 3-lobed or 3-awned.

Panicle spiciform; spikelets 2 to 5-flowered; flowering glumes scarious, second, mucronate or shortly awned . . . 76. *Koeleria*.

Inflorescence various; spikelets many-flowered; empty glumes shorter than the lowest flowering glume, 1-nerved; flowering glumes 3-nerved; grain minute . . . 77. *Eragrostis*.

Several empty awned glumes above 1 or 2 flowering ones. Panicle narrow and dense or loose and spreading . . . 78. *Ectrostia*.

Many empty glumes above 1 flowering one, all awnless. Panicle contracted into a dense head or interrupted spike . . . 79. *Heterachne*.

Spikelets several-flowered, paniculate; flowering glume with 3 narrow awned lobes . . . 80. *Triaraphis*.

Spikelets several-flowered, paniculate; flowering glume with 3 unawned lobes or teeth . . . 81. *Triodia*.

Spikelets several-flowered, awnless in a simple or in scattered spikes; flowering glumes with a minute point between 2 small hyaline lobes . . . 82. *Diplachne*.

SUBTRIBE V. Centothecææ.—Spikelets 1 to many-flowered, 1 to 2-seriate on the rhachis of a simple spike or the long slender branches of a simple panicle. Leaves broad, tessellately nerved.

Spikelets 3 or more-flowered, second, persistent; flowering glumes with reflexed submarginal bristles . . . 83. *Centotheca*.

SUBTRIBE VI. Mufestuceææ.—Spikelets usually paniculate, 2 or more-flowered; flowering glumes 5, many (very rarely 3) nerved, upper empty or none; styles short.

Spikelets few-flowered, in close second clusters; the first and second glumes shorter than the mucronate or awned flowering glume . . . 84. **Dactylis*.

Spikelets ovate, in a lax pyramidal panicle, pendulous; glumes inflated, closely imbricate, many-nerved, dorsally convex . . . 85. *Briza*.

Spikelets laxly paniculate, few-flowered; glumes keeled, 5-nerved, awnless, nerves rarely meeting at the tip . . . 86. *Poa*.

Spikelets paniculate, many-flowered, awnless; glumes obtuse, dorsally rounded, 5 to 9-nerved, lateral nerves short . . . 87. *Glyceria*.

Spikelets paniculate, many-flowered; flowering glumes acute or awned, dorsally rounded, top of ovary naked or hairy . . . 88. *Festuca*.

Spikelets paniculate, 3 to many-flowered; flowering glumes mucronate or awned, dorsally rounded, 5 to 9-nerved, top of ovary lobed villous . . . 89. *Bromus*.

TRIB. X. Hordeææ.—Spikelets 1 or more-flowered, sessile, 1 to 2 or more-seriate on the rhachis of a simple spike, or partially sunk in cavities of the same; rhachilla usually articulate and produced beyond the flowering glumes into a naked or glumiferous bristle; glumes awned or not, first and second opposite or subcollateral, persistent or separately deciduous, the first sometimes absent or very minute.

SUBTRIBE I. Loliceææ.—Spikelets solitary at the nodes of the spike, plane of the spikelets radial to the rhachis.

Spikelets 3 to many-flowered; glumes coriaceous, one absent except in terminal spikelet . . . 90. **Lolium*.

Spikelets 1 to 2-flowered; 1st glume minute or absent, 2nd much longer than the hyaline 3rd; spike cylindrical, rhachilla glabrous . . . 91. *Lepturus*.

SUBTRIBE II. **Triticæ**.—Spikelets solitary at the nodes of the spike; plane of spikelets tangential to the rachis.

Flowering glumes 5 to 9-nerved, the lateral nerves not conniving, short or ending in teeth or awns

93. ***TRITICUM**.

Flowering glumes 5 to 7-nerved, the lateral nerves conniving or confluent with the single terminal awn.

93. **AGROPERUM**.

SUBTRIBE III. **Stylæ**.—Spikelets 2 or more, collateral or fasciculate at the nodes of the spike; plane of spikelets tangential to the rachis.

Spikelets 1-flowered; empty glume subulate, rigid 94. ***HORDEUM**.

TRIBE XI. **Bambusæ**.—Shrubby or arborescent grasses. Leaves flat, jointed on the sheath. Spikelets 1 to many-flowered; lower 2 or more glumes empty, generally increasing in size up to the flowering, with sometimes small terminal imperfect ones. Palea usually large, 2-keeled. Lodicules usually 3. Stamens 3, 6 or none. Styles 2 to 3.

Flowers of Queensland species unknown, therefore tribe doubtful. Species climbing 95. **BAMBUSA**.

1. PASPALUM, Linn.

(One of the Greek names for millet.)

Spikelets 1-flowered, not awned, not callous at the base, in one or 2 rows along one side of slender spikes, either forming the branches of a simple panicle, or rarely solitary. Glumes 3, 2 outer ones empty, usually membranous and equal or nearly so, the third flowering of a firmer texture. Palea within the flowering glume smaller and more involute. Styles distinct, rather long. Grain enclosed in the hardened palea and flowering glume, and free from them.

A large tropical and subtropical genus, especially abundant in America, where it is also extratropical.

Spikes of panicle 3 to 14, 2in. or more long. Spikelets orbicular, with purplish hairs, about $\frac{1}{2}$ line diameter

1. *P. Galmarra*.

Spikes usually 4, 3 to 4in. long. Spikelets ovate, acute, very hairy

2. *P. dilatatum*.

Spikes 2 terminal or if 3 one placed lower down the peduncle. Spikelets roundish-oval, about 1 line long

3. *P. Polo*.

Spikelets 2 to 5, usually distant. Spikelets orbicular or broadly ovate, obtuse, about 1 line long

4. *P. scrobiculatum*.

Spikes 2, close together or scarcely distant. Spikelets ovate-oblong, acute or acuminate, $\frac{1}{2}$ to 2 lines long

5. *P. distichum*.

Spikes 2 or 3, digitate or nearly so. Spikelets ovate, about $\frac{1}{2}$ line long

6. *P. brevifolium*.

Spikes rather numerous, filiform. Spikelets narrow-ovate, about $\frac{1}{2}$ line long

7. *P. minutiflorum*.

Spikes 2, very divergent, 4 to 6in. long. Spikelets about $\frac{1}{2}$ line

8. *P. conjugatum*.

Spikes about 2in. long, 2 terminal, if 3 one placed lower down the peduncle.

9. *P. platycaule*.

Outer glumes with green lines

1. **P. Galmarra** (after Galmarra, Jacky Jacky, Explorer Kennedy's faithful aboriginal), *Bail. Bot. Bull.* ix. Russell River Grass. This is a very robust succulent grass, attaining even on the rocky land about Brisbane 3 or 4ft. in height, stems numerous to each stool, the lateral ones often bending down and rooting from the joints. Leaves numerous, the blade about 1ft. long and often above 1in., broad, ligula short, scarious, hidden by long silky hairs, sheath loose. Panicles with many somewhat erect branches. Spikelets orbicular, about $\frac{1}{2}$ line diameter; glumes covered with short purplish hairs.

Hab.: Russell River.

One of the best fodder grasses, and has been cultivated successfully about Brisbane. It is closely allied to the South American species, *P. paniculatum*, Linn.

2. **P. dilatatum** (extending), *Poir. Enc.* v. 32; *Mart. Fl. Brazil*, ii., Part ii. 64. Caterpillar Grass. Rootstock shortly creeping, the radical leaves abundant; the erect stems 2 to 4ft. high, geniculate at the base, more or less compressed, nodes glabrous, and often enlarged. Leaf-sheaths long loose and compressed; blade 9 to 15in. long, tapering to thread-like points, contracted and more or less hairy at the base; ligula membranous. Spikes usually 4, 3 to 4in.

long, rhachis glabrous and narrowly winged. Spikelets imbricate in alternate pairs, the short pedicels hairy, and one shorter than the other. Glumes numerous, margins ciliate, 8 to 5-nerved. Anthers and stigmas purple.—*G. ovatum*, Nees; Trin. Spec. Gram. ii. t. 189.

Hab.: Brazil. This is the best of the introduced species and takes kindly to our climate.

3. **P. Polo** (name of creek where found), *Bail. Ql. Agric. Journ.* i. Pt., 1. Stems few from each root, erect, somewhat flattened and slender, 1½ ft. high. The sheaths of the leaves on the lower part of the stems hirsute with stiff spreading hairs, the upper ones glabrous except for a few long hairs about the orifice; ligula scarious, truncate, blades 5 to 6 in. long, 3 lines broad, tapering to filiform points, glabrous, with nearly smooth edges. Spikes usually 2, when 3 two together at the top and the third inserted lower down, 2 in. long, slightly tomentose at the base. Spikelets about 1 line long, oval-orbicular, in 2 crowded rows, on very short pedicels. Outer glumes with a prominent midrib and a faintly marked nerve on each side near the margin. Fruiting glume hard glossy-brown with no visible nerves.

Hab.: Polo Creek, Cape York Peninsula. This may probably prove a useful pasture grass.

4. **P. scrobiculatum** (furrowed), *Linn.; Kunth, Enum.* i. 52; *Benth. Fl. Austr.* vii. 460. Ditch Millet. Erect or ascending, attaining 1 to 4 ft., the Australian specimens glabrous or rarely with a few long hairs at the base of the leaf-blades. Spikes varying from 2 to 5, alternate, spreading, usually distant, 1 to 2 or rarely nearly 3 in. long, the rhachis usually flat and about 1 line broad, and sometimes minutely pubescent at the base. Spikelets sessile or shortly pedicellate in 2 close rows or rarely in part at least of the spike crowded into 3 or 4 rows, ovoid-orbicular, obtuse, flat, about 1 line long when in fruit. Outer empty glumes thinly membranous, with a prominent midrib, sometimes minutely pubescent. Fruiting glume similar in shape but soon hardened, very finely striate, the central nerve visibly only in the young state. Palea hardened like the flowering glume, the inflected margins dilated at the base into broad hyaline auricles enveloping the flower.—Trin. Spec. Gram. ii. t. 148; F. v. M. Fragm. viii. 156; *P. orbiculare*, Forst.; R. Br. Prod. 188; *P. polystachyum*, and *P. pubescens*, R. Br. l.c.; *P. metabolon*, Steud. Syn. Glum. i. 19; Duthie Ind. Gr. Pl. i.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*; between Norman and Gilbert Rivers, *Gulliver*; Sweers Islands, *Henne*; Northumberland Islands, *R. Brown*; Rockingham Bay, *Dallachy*; Port Denison, *Fitzalan*; Percy Island and Port Curtis, *M'Gillivray*; Brisbane River, *F. v. Mueller*.

Inflorescence sometimes infested with the fungus blights, *Ustilago Cesatii*, *Waldh.*, and *Cerebella paspuli*, *C. & M.*

Frequent in tropical and subtropical Asia and Africa. All or nearly all Australian specimens belong to the variety still distinguished by some as a species under Forster's name *orbiculare*, usually a more slender plant with smaller spikelets, the rhachis often pubescent at the base, and the outer glumes scarcely or not at all scrobiculate. The marginal indentures and the intermediate nerves between the midrib and the marginal ones of the typical *P. scrobiculatum* are chiefly prominent in cultivated varieties.—*Benth.*

5. **P. distichum** (two-rowed), *Linn.; Kunth, Enum.* i. 52; *Benth. Fl. Austr.* vii. 460. Water Couch. Stems often creeping and rooting in the sands to a great extent, the ascending extremities varying from short and entirely covered with the leaf-sheaths, to slender 1 ft. long or more with the leaves distant. Leaves either linear-lanceolate and flat or involute and almost subulate, glabrous or with a few long hairs at the orifice of the sheath and base of the lamina. Spikes 2, close together or the lowest at a distance of 1 to 2 lines, quite glabrous, the rhachis not above ½ line broad. Spikelets sessile in 2 rows, oval-oblong, acute or acuminate, flat, 1½ to nearly 2 line long. Outer empty glumes equal and

distinctly 8-nerved. Fruiting glume hardened and very faintly 8-nerved or the central nerve alone perceptible.—F. v. M. Fragm. viii. 156; *P. littorale*, R. Br. Prod. 188; Trin. Spec. Gram. i. t. 112.

Hab.: In Queensland, this species is represented by the two following varieties.

Var. **normale*. A rather broad-leaved creeping grass which has been introduced and has become naturalised in many wet localities, many South Queensland fresh-water swamps being now overrun with it. It is the common grass of our town gutters; is a much more rank grass than the Australian form found in brackish swamps.

Var. *littorale*. This has much shorter running underground stems than the introduced form and also differs in its narrower leaves, erect stems, and being only met with in coast swamps, where it forms a most nutritious pasture. These two varieties keep their distinctive characters when grown side by side on damp land, or near fresh-water swamps, but this latter thrives best and is always found in brackish swamps where the former cannot live; Bail. Ill. Mono. Gr. Q. i.

Widely distributed over the tropical regions of both the New and the Old World.

6. *P. brevifolium* (short-leaved), Flüggé; Kunth, *Enum.* i. 48; Benth. *Fl. Austr.* vii. 461. Stems from a creeping or much-branched base erect, slender, 1ft. high or rather more. Leaves short, narrow, flat, the sheaths usually villous or pubescent, the ligula scarious, jagged. Spikes or panicle-branches 2 or rarely 3, digitate at the end of the peduncle, filiform, 1 to 2in. long. Spikelets scattered along one side of the rachis, on short curved pedicels, ovate, rather obtuse or almost acute, about $\frac{1}{2}$ line long, sprinkled with short fine, appressed silky hairs. Empty glumes 2, rather obtuse, nearly equal, thin, finely 5-nerved.—*Panicum tenuiflorum*, R. Br. Prod. 198.

Hab.: Keppel Bay, R. Brown; Brisbane River, Moreton Bay, F. v. Mueller, Bailey; Rockhampton, O'Shanesy; Herbert's Creek, Bowman; Archer's Flat, Leichhardt; Rockingham Bay, Dallachy.

An early summer grass.

Var. *propinquum*. Rather taller. Leaves rather longer. Spikes 2 to 3in. long.—*Panicum propinquum*, R. Br. Prod. 193.

Hab.: Gulf of Carpentaria, R. Brown.

The species is widely spread over tropical Asia.

7. *P. minutiflorum* (flowers small); Steud. *Syn. Glum.* i. 17; Benth. *Fl. Austr.* vii. 461. A rather tall glabrous grass, closely resembling at first sight the *Panicum parviflorum*, Br., but with the characters of *Paspalum*; and nearly allied to *P. brevifolium*. Leaves flat, rather long and narrow, the ligula short not ciliate. Spikes or panicle-branches rather numerous, filiform, alternate or the upper ones clustered, 3 to 5in. long. Spikelets numerous, very shortly but unequally pedicellate, narrow-ovate, rather acute, about $\frac{1}{2}$ line long. Empty glumes 2, nearly equal, prominently 8-nerved, glabrous or the margins minutely ciliate. Fruiting glume acute, smooth and shining.

Hab.: From Brisbane River to Rockhampton.

An autumn grass.

This species and *P. brevifolium*, Flüggé, are placed by Hook. in *Fl. Brit. Ind.* vii. 17, under *P. longiflorum*, Retz.

Widely spread over tropical Asia.

8. *P. conjugatum* (coupled), Berg. in *Act. Helvet.* vii. (1772) 129, t. 8; Hook. in *Fl. Brit. Ind.* vii. 11.; Trin. *Sp. Gram.* 1c. 102. A perennial creeping grass rooting at the nodes and sending up stout or slender stems from 1½ to 3ft. high. Leaves bright-green, 4 to 6in. long, $\frac{1}{2}$ to $\frac{3}{4}$ in. broad, margins ciliate, points thread-like. Spikes 2, divergent; 4 to 6in. long, spikelets imbricate, pale, plano-convex; glumes with marginal, villous nerves, 3rd one coriaceous, apiculate, white.

Hab.: Johnstone River, and other tropical scrubs.

Found also in tropical and subtropical regions of both the New and the Old World.

9. *P. platycaule* (stem broad), Poir. Stems creeping close to the ground and rooting at the nodes; internodes very short, erect stems from each node, flat, very leafy at the base, about 12 or 15in. high; nodes woolly-hairy; leaf-sheaths

very flat, glabrous, with ciliate margins; ligula rather short and jagged, lamina narrow-oblong, apex blunt, hairy about the base, margins undulate and ciliate; lower leaves 4 or 5 in. long and 7 to 8 lines broad, the upper one smaller. Peduncle exceeding the upper leaf by about 2 in. Spikes 2 or 3, hairy at the base; when 3 two at the end of the peduncle and the other $\frac{1}{2}$ in. lower; about 2 in. long, rhachis slightly flexuose. Spikelets alternate, forming a single row; outer 2 glumes marked with 2 green lines on each margin, softly hairy; others nearly white, nerveless, with a small tuft of hairs at the apex of the third.

Hab.: Cairns and along the Mulgrave road. Indigenous also in tropical Africa and America.

2. ERIOCHLOA, Humb. and Kunth.

(Woolly grass.)

(*Helopus*, Trin.)

Spikelets 1-flowered, without protruding awns, with a callous annular or almost cuplike base, articulate on a short pedicel; in 1 or 2 rows along 1 side of the slender branches of a simple panicle. Glumes 8, 2 outer ones empty, usually membranous, equal or nearly so, the 3rd or flowering glume shorter, of a firm coriaceous texture, obtuse but tipped with a point or short awn not exceeding the outer glumes. Palea within the flowering glume coriaceous and involute. Styles distinct, rather long. Grain enclosed in the hardened palea and flowering glume and free from them.

A small tropical genus, common to the New and the Old World. One species is probably endemic, the others have both a wide range in hot countries.

- Spikelets usually above $1\frac{1}{2}$ line long, the rhachis of the spikes and main axis of the panicle pubescent or hirsute 1. *E. punctata*.
Spikelets, including the point, 2 lines long; pedicel hairy 2. *E. decumbens*.
Spikelets usually under $1\frac{1}{2}$ line long, the rhachis and main axis glabrous 3. *E. annulata*.

1. ***E. punctata*** (dotted), *Hamilt.*; *Kunth, Enum.* i. '72; *Benth. Fl. Austr.* vii. 462. An erect glaucous grass attaining 2 or 3 ft., glabrous except the inflorescence and sometimes a slight pubescence in the upper part. Leaves rather long, flat or convolute when dry. Spikes or panicle-branches about 5 to 8, distant, erect, secund, the lowest often above 2 in. long, the others gradually shorter, the rhachis as well as the main axis pubescent or hairy. Spikelets all pedicellate, but often rather close, the pedicels 1 to 2 lines long, usually bearing a few long hairs, the spikelet ovoid, acute or shortly acuminate, rather above $1\frac{1}{2}$ line long, seated on a thick annular or almost cupular disk articulate on the pedicel. Empty glumes membranous, broad, and usually 5-nerved, or the inner one rather narrower and sometimes only 3-nerved, both more or less hairy outside and sometimes rather densely covered with long hairs. Flowering glume much shorter, coriaceous, faintly 3 or 5-nerved, obtuse, but the midrib produced into a point or awn as long as the outer glumes as in *Panicum helopus*; *Bail.* Ill. Mono. Gr. Q. i.—*Milium punctatum*, Linn.; *R. Br. Prod.* 188; *Paspalum punctatum*, Flügge; *Trin. Spec. Gram.* t. 155.

Hab.: Shoalwater Bay, Keppel Bay, Broadsound, *R. Brown*; Brisbane River, Moreton Bay, *F. v. Mueller*, *Prentice*; Springsure, *Wuth*.

2. ***E. decumbens*** (decumbent), *Bail. Ql. Agric. Journ.* i., Pt. 1. A weak decumbent grass, the stems slender and branching, often geniculate, 1 to 2 ft. long, more or less pubescent about the nodes. Leaves 8 to 5 in. long, tapering from the base to fine thread-like points, pubescent at top of sheath; the ligula reduced to cilia. Spikes or panicle-branches about 5, secund, 1 in. long, pedicels with numerous long hairs especially under the spikelets. Spikelets silky, includ-

ing the long fine awn-like point 2 lines long; 2 outer glumes silky membranous with rather long awns; 3rd glume shorter, punctulate awned, somewhat coriaceous; stigmas dark-purple.

Hab.: On rocks, Hammond Island, Torres Strait.

This grass differs from the other Australian species of the genus, principally in habit.

8. *E. annulata* (annular), Kunth, *Enum.* i. 78; *Benth. Fl. Austr.* vii. 468. A smaller and more slender green grass than *E. punctata*, the leaves usually narrower, glabrous. Spikes slender, 1 to 1½ in. long, the main axis of the inflorescence as well as the rhachis usually glabrous, the pedicels sometimes bearing a few short hairs. Spikelets narrow, tapering at the end, scarcely 1½ line long, including the point, which is rather longer than in *E. punctata*. Empty glumes much less hairy than in that species, 3 or rarely 5-nerved. Flowering-glume the same.—*Paspalum annulatum*, Flüge; Trin. Spec. Gram. t. 188.

Hab.: Brisbane River, *F. v. Mueller, Prentice*; Rockhampton, *Thozet, Bowman*; Darling Downs, *Law*.

8. ISACHNE, R. Br.

(Referring to the 2 equal outer glumes.)

Spikelets 2-flowered, both flowers hermaphrodite or the upper female or the lower male, small, in loose panicles, the rhachis of the spikelet articulate above the empty glumes, glabrous and not produced above the flowering ones. Glumes unawned, convex, faintly nerved, 2 outer empty ones nearly equal; flowering ones of a firmer consistence, closely sessile or the upper one slightly raised. Palea as long as the glume. Styles distinct. Grain enclosed in the hardened glume and palea, free from them.

A small tropical genus, common both to the New and the Old World. The Queensland species have both a wide range in tropical Asia.

Leaves lanceolate. Spikelets glabrous or nearly so, nearly 1 line long. . . . 1. *I. australis*.

Leaves ovate, small. Spikelets hairy, about ½ line long. . . . 2. *I. myosotis*.

1. *I. australis* (southern), R. Br. *Prod.* 156; *Benth. Fl. Austr.* vii. 625. Stems rather slender, decumbent, creeping and rooting at the lower nodes, ascending to 1 ft. or more. Leaves lanceolate, rough with a minute pubescence. Panicle loose, spreading, ovoid in circumscription, 1½ to 3 in. long, with numerous filiform branches. Spikelets all pedicellate, nearly 1 line long. Outer glumes quite glabrous. Lower flower usually male, with a glabrous glume, the upper female, shortly stipitate, with the glume usually minutely and slightly pubescent, the rhachis slightly dilated and articulate immediately under the upper glume.—Bailey's Ill. Mono. Gr. Q. i.; Buch. Ind. Gr. N.Z. pl. xii.; Turner Ill. Austr. Gr. 31; *Panicum atrovirens*, Trin.; Kunth, *Enum.* i. 127; *F. v. M. Fragm.* viii. 193; *P. antipodum*, Spreng. Syst. i. 314.

Hab.: Moreton Bay, *F. v. Mueller*.

Also in tropical Asia from Ceylon and the Peninsula to the Malayan Archipelago and South China.

2. *I. myosotis* (Myosotis-like), Nees in Hook. *Kew. Journ.* ii. 98; *Benth. Fl. Austr.* vii. 625. Stems slender, decumbent and branched at the base, generally short but sometimes extending to 1½ ft. Leaves ovate to ovate-lanceolate; small to above 1 in. long, scabrous, with hairy sheaths and ciliate margins. Panicles ovoid and loose with slender spreading branches as in *I. australis* but smaller. Spikelets much smaller, rarely above ½ line long, the 2 outer glumes more or less pubescent or hirsute, sometimes very much so; flowering glumes glabrous or nearly so, the upper flower female the lower hermaphrodite.—*Benth. Fl. Hongk.* 415; *Panicum myosotis*, Steud. Syn. Glum. i. 96; *F. v. M. Fragm.* viii. 193.

Hab.: Russell River, *W. Hill*.

Also in the Malayan Archipelago and South China.

4. PANICUM, Linn.

(The old Latin name from the inflorescence being so frequently in panicles.)

(*Digitaria*, Scop. ; *Echinochloa*, Beauv. ; *Coridochloa*, Nees).

Spikelets with 1 terminal hermaphrodite flower and occasionally a male or rudimentary flower below it, rarely awned, variously arranged along the branches of a simple or compound panicle, rarely reduced to a simple spike, the partial rhachis very rarely produced beyond the last spikelet; barren awn-like branches none, or very rarely a single one. Glumes usually 4, the outer one smaller than the others, not awned, often very small, deficient only in *P. gibbosum*, the 2nd and 3rd very variable in relative proportions, the 3rd occasionally with a palea with or without 8 stamens in its axil; 4th or fruiting glume smaller or as long as the 3rd, of a firmer consistence, enclosing a palea and hermaphrodite flower. Styles distinct or very shortly united at the base. Grain enclosed in the hardened fruiting glume and palea, but free from them.

One of the largest genera of Gramineæ, abundantly represented in all tropical countries, a few species extending beyond the tropics in the Old World, and a somewhat larger number in North America.

The great differences in inflorescence, a character admitted as generic in most Gramineæ, has induced the division of *Panicum* into several genera more or less adopted by Nees, Kunth and others, but there are so many intermediate species connecting the different groups or series that I have not succeeded in giving characters positive enough to define them even as sections. —Benth.

SERIES I. *Digitariæ*.—Spikelets mostly in pairs along the outer or lower side of the simple slender branches of the panicle, one of each pair always pedicellate, the other sessile or on a shorter pedicel, the upper ones of each branch occasionally solitary, the lower ones very rarely clustered. Outer glume usually very small.

(While I have followed Sir Jos. Hooker in many instances where he has differed from the Gen. Pl. of B. and H., in the placing of *Series Digitariæ* of *Panicum* in the genus *Paspalum* I have not done so, as I consider that to do so with the Queensland species would be confusing to the persons who will use this Flora; where, however, an alteration affected a single species only I have followed that eminent author's excellent arrangement given in the vil. vol. of the Flora of British India.)

Branches of the panicle often numerous, the lower ones long and verticillate, the upper ones scattered.

Lowest spikelet of each pair sessile.

Spikelets $1\frac{1}{2}$ to 2 lines long, more or less silky hairy 1. *P. cenicolum*.

Spikelets 1 to $1\frac{1}{2}$ line long, more or less silky hairy 2. *P. divaricatissimum*.

Spikelets 1 to $1\frac{1}{2}$ line long, not silky, but the lateral nerves of the third glume ciliate with rigid hairs seated on tubercles 3. *P. macractinium*.

Both spikelets of each pair on long capillary pedicels, one pedicel much longer than the other. Spikelets under 1 line long, glabrous or silky hairy 4. *P. papposum*.

Branches of the panicle few, digitate or clustered at the end of the peduncle.

Branches 3 to 8. Spikelets of each pair similar, both fertile, glabrous or softly ciliate 5. *P. sanguinale*.

Branches of the panicle scattered or the upper ones approximate, the lower ones rarely clustered and not verticillate.

Branches usually 3, distant, 1 to $1\frac{1}{2}$ in. long. Spikelets ovoid, about $\frac{1}{2}$ line long 6. *P. tenuissimum*.

Branches often numerous, 2 to 6 in. long. Spikelets glabrous, $\frac{1}{2}$ to $\frac{3}{4}$ line long, the lower ones often clustered 7. *P. parviflorum*.

Branches often numerous, 2 to 6 in. long. Spikelets narrow, nearly 1 line long, silky hairy 8. *P. Baileyi*.

(The spikelets are usually in pairs also in *P. prostratum*, and occasionally in some others.)

SERIES II. *Trichachnæ*.—Spikelets silky hairy, or fringed with long hairs, sessile or shortly pedicellate, clustered or rarely in pairs along the rhachis of the simple spike-like panicle or of the 2 or few long erect branches.

Spike single. Spikelets mostly in pairs, about 1 line long, silky hairy, the outer glume deficient 9. *P. gibbosum*.

Spike-like branches few or spike single. Spikelets mostly clustered, 1 to $1\frac{1}{2}$ line long, the outer glume present but small and often concealed by the long silky hairs 10. *P. leucophæum*.

SERIES III. *Paspaloideæ*.—Spikelets sessile or very shortly-pedicellate, in 1 or 2 rows, very rarely in pairs, along the short simple alternate often distant spikes or spike-like branches of the panicle, rarely reduced to a single terminal spike.

- Spikes erect, distant or single. Spikelets usually sessile. Spike single, terminal. Spikelets glabrous, singly distant or the lowest in pairs.
- Fruiting glume glabrous, rugose 11. *P. rarum*.
 Fruiting glume densely and softly pubescent 39. *P. marginatum*.
- Spikes several, distant. Spikelets with long silvery-silky hairs.
- Spikelets truncate, singly distant 12. *P. argenteum*.
 Spikelets ovoid, often approximate 13. *P. holovericeum*.
- Spikelets several, distant. Spikelets glabrous, in 2 close rows.
- Spikelets oblique, 1 to $1\frac{1}{2}$ line long in 2 close regular rows, 2nd glume broad gibbous, 3rd glume flatter, with a palea in its axil 14. *P. flavidum*.
 Spikelets nearly straight, 1 to $1\frac{1}{2}$ line long, the rows not always regular and sometimes very few in the spike, 2nd and 3rd glumes nearly equal, both empty 15. *P. gracile*.
 Spikelets obtuse, in 2 irregular rows. Outer glume nearly as long as others 16. *P. jubiflorum*.
- Spikes usually approximate, erect or at length spreading. Spikelets not so closely sessile and frequently subtended by hairs or bristles.
- Spikelets about 1 line long, frequently in pairs. A palea in the 3rd glume. Fruiting glume obtuse, rarely tipped with a minute point 17. *P. prostratum*.
 Spikelets scarcely $\frac{3}{4}$ line long, 3rd glume male or neuter, 4th glume obtuse, margins incurved 18. *P. *muticum*.
 Spikelets nearly 2 lines long, in 2 rows. A broad palea in the 3rd glume. Fruiting glume obtuse, with an awn-like point 19. *P. helopus*.
 Spikelets nearly 2 lines long, in 2 rows. A broad palea in the 3rd glume, which is ciliate with long hairs. Fruiting glume obtuse with a short point 20. *P. Gilesii*.
 Spikelets nearly 2 lines long, in 2 rows. 3rd glume empty. Fruiting glume obtuse without any point. Leaves hairy 21. *P. piligerum*.
 (See also the first four species of the *Paniculatæ*).
- Spikes distant, at length spreading or reflexed. Spikelets alternate along the rhachis but not close and appearing almost uniseriate.
- Leaves glabrous. Spikelets near together on a flattened rhachis 22. *P. distachyum*.
 Leaves glabrous. Spikes reflexed, the rhachis flattened, ending in an awn-like point, and a rigid awn-like bristle under the lowest spikelet 23. *P. reversum*.

SERIES IV. *Echinochloæ*.—Spikelets sessile and crowded in 3 or 4 rows or irregularly along the simple alternate usually secund spikes or spikelet branches of the panicle. Glumes sometimes awned.

- Spikelets about 1 line long, never awned, densely crowded in 4 rows along the rhachis, without hairs or bristles 24. *P. colonum*.
 Spikelets $1\frac{1}{2}$ to 2 lines long, acuminate or awned, crowded and clustered along the rhachis, usually intermixed with rigid hairs or bristles 25. *P. crus-galli*.

SERIES V. *Myuroideæ*.—Spikelets not silky, crowded and clustered in a dense continuous or rarely interrupted cylindrical spike-like panicle.

- Spikelets ovoid, obtuse, $\frac{1}{2}$ to $\frac{3}{4}$ line long 26. *P. myosuroides*.
 Spikelets acuminate, curved, 1 to $1\frac{1}{2}$ line long or rather more 27. *P. indicum*.
 Spikelets acuminate, 2 to 3 lines long. Fruiting glume thin 28. *P. myurus*.

SERIES VI. *Paniculatæ*.—Panicle-branches usually more or less divided. Spikelets all pedicellate (except sometimes the first four species.)

- Panicle-branches scarcely divided. Spikelets few, rarely more numerous, scarcely under 2 lines long. No male flowers.
- Spikelets nearly or sometimes quite sessile. (Species approaching the *Paspaloideæ*).
- Spikelets 2 to $2\frac{1}{2}$ line long, mostly distant along the branches 29. *P. foliosum*.
 Spikelets rather under 2 lines, crowded on the lower part of the branches in a compact panicle, 2nd and 3rd glumes almost equal 30. *P. adspersum*.
 Spikelets $1\frac{1}{2}$ line long, rather crowded on the distant branches of a long and narrow panicle. Outer glume $\frac{1}{2}$, 2nd $\frac{1}{2}$ as long as the 3rd 31. *P. inaequale*.

- Spikelets few, distinctly pedicellate, in a loose spreading panicle.
 Spikelets $2\frac{1}{2}$ to 3 lines long, sprinkled with hooked hairs. Fruiting glume close above the others 32. *P. uncinulatum*.
 Spikelets 2 lines long, glabrous. Fruiting glume raised above the others. Panicle scarcely exceeding the floral leaves 33. *P. pauciflorum*.
 Panicle narrow or spreading. Spikelets numerous, 1 to near 2 lines long. A male flower in the 3rd glume.
 Spikelets often numerous, shortly pedicellate, not clustered. Glumes acute or acuminate 34. *P. repens*.
 Panicle large. Spikelets obtuse, $1\frac{1}{2}$ line long. Fruiting glume rugose 35. *P. *maximum*.
 Spikelets $\frac{1}{2}$ to $\frac{3}{4}$ line long. No male flower.
 Diffuse or creeping. Panicle-branches few, spreading. Spikelets few and distant, $\frac{3}{4}$ line long, on short pedicels 36. *P. pygmaeum*.
 Erect. Panicle-branches numerous, capillary. Spikelets $\frac{1}{2}$ line long, on capillary pedicels 37. *P. trichoides*.
 Ascending or erect. Panicle narrow, rather dense. Spikelets very numerous, $\frac{3}{4}$ line long. Fruiting glume very gibbous 38. *P. hermaphroditum*.
 Spikelets usually numerous, 1 to near 2 lines long, pedicellate. No male flower.
 Panicle narrow, branches usually few.
 Fruiting glume densely pubescent 39. *P. marginatum*.
 Fruiting glume smooth and shining.
 Panicle 1 to 2 in. long. Outer glume ovate, acute. Leaves pubescent 40. *P. lachnophyllum*.
 Panicle 1 to 2 in. long. Spikelets about 1 line. Outer glume ovate, acute. Leaves glabrous 41. *P. obseptum*.
 Panicle 3 to 4 in. long. Spikelets nearly 2 lines. Outer glume short, broad, truncate. Leaves glabrous 42. *P. Bunciei*.
 Panicle spreading with numerous capillary branches.
 Panicle-branches scattered, neither clustered nor verticillate.
 Spikelets 1 line long, acute. Outer glume acute. A palea in the 3rd glume 43. *P. bicolor*.
 Spikelets 1 line long, rather obtuse. Outer glume acute. No palea in the 3rd glume 44. *P. melananthum*.
 Lower panicle-branches clustered but scarcely verticillate.
 Spikelets numerous, pedicellate, 2 lines long. Outer glume acute, 3-nerved, 2nd and 3rd 7 to 11-nerved, fruiting-glume shining 45. *P. miliaceum*.
 Very tall. Outer glume scarcely acute, 3-nerved; 2nd and 3rd glumes 5-nerved 46. *P. Prenticeanum*.
 Spikelets about 1 line. Outer glume acute, half as long as the spikelet. A palea in the 3rd glume. Nodes prominently ciliate. Ligula a ring of long cilia 47. *P. effusum*.
 Spikelets of *P. effusum*. Nodes glabrous. Ligula very short 48. *P. Mitchellii*.
 Spikelets about 1 line. Outer glume short, broad, truncate or scarcely acute, nerveless. A palea in the 3rd glume 49. *P. decompositum*.
 1st glume nearly orbicular, one-sixth to one-quarter of the 3rd; 2nd ovate, 9-nerved; 3rd lanceolate, 9-nerved, paleate or not; 4th oblong, acuminate, smooth 50. *P. proliferum*.
 Lower panicle-branches verticillate. Outer glume nearly as long as the others. A palea in the 3rd glume.
 Ligula very short, with a ring of cilia 51. *P. trachyrhachis*.
 Ligula prominent, scarious, without cilia 52. *P. prolutum*.

1. *P. cœnicolum* (growing near manure), *F. v. M. in Trans. Vict. Inst.* 1855, 45; *Benth. Fl. Austr.* vii. 467. Stems from a knotty branching base ascending to 1ft. or more. Leaves flat, usually softly pubescent or villous. Panicle of rather numerous slender simple branches, 3 to 4 in. long, at first erect, at length spreading, the lower ones verticillate, the upper ones alternate and distant, or rarely in pairs. Spikelets in pairs, 1 sessile, the other pedicellate, oblong, $1\frac{1}{2}$ to 2 lines long. Outer glume not exceeding $\frac{1}{2}$ line long, the 2nd rather shorter than the spikelet, 5 or 7-nerved, the 3rd 7 to 11-nerved; both more or less silky-hairy and empty. Fruiting glume smooth, acute.—*Turn. Ag. Gaz. N.S.W.* iv. Pl. xvi.

Hab.: Recorded for Queensland by *F. v. M.*

2. ***P. divaricatissimum*** (very divaricate), *R. Br. Prod.* 192; *Benth. Fl. Austr.* vii. 467. Stems from a branching base sometimes under, sometimes much above 1ft. high. Leaves glabrous or more or less pubescent or softly villous, the ligula not prominent and not ciliate. Panicle of rather numerous rigidly filiform simple branches 8 to 8in. long, at first erect, at length spreading, the lower ones in a dense verticil, the upper ones alternate and distant. Spikelets in pairs or rarely solitary along the branches, one sessile, the other pedicellate, 1 to $1\frac{1}{2}$ line long, glabrous or covered with long silky hairs spreading when in fruit. Outer glume very small, ovate, obtuse, the 2nd and 3rd nearly equal and both empty or the 3rd rarely with a minute rudimentary palea, the 2nd usually 3-nerved, the 3rd 5-nerved. Fruiting glume ovoid, not gibbous, glabrous, smooth, acute.

The following are given as more or less distinct varieties of this species by *Benth.* in *Fl. Austr.*:—

1. *glaberrimum*. Stems tall, branches of the panicle sometimes more than 8in. long, the whole plant glabrous. Spikelets $1\frac{1}{2}$ line long, glabrous.

Hab.: Rockhampton and neighbourhood, *Thozet*, *O'Shanesy*; Peak Downs, *Burkitt*; Darling Downs, *Law*.

2. *normale*. Foliage glabrous or nearly so. Panicle-branches 4 to 8in. long. Spikelets $1\frac{1}{2}$ line long, silky-villous, rarely nearly glabrous.—*Turn. Ag. Gaz. N.S.W.* iv. Pl. xx.

Hab.: Keppel Bay, *R. Brown*.

3. *radiatum*. Foliage softly villous. Spikelets small, glabrous or nearly so.—*P. radiatum*, *R. Br. Prod.* 192.

Hab.: Ballandool, *Lockyer*; Armadilla, *Barton*.

8. ***P. macractinium*** (rays of the verticil long), *Benth. Fl. Austr.* vii. 468. Allied to *P. divaricatissimum*, but taller and quite glabrous. Panicle similar, the slender branches rigid, often 6 to 8in. but sometimes much longer, the lower ones in a dense verticil, the upper ones alternate and distant. Spikelets distant in pairs, one almost sessile, the other on a longer pedicel, both fertile and similar, narrow, acute, about $1\frac{1}{2}$ line long. Outer glume $\frac{1}{2}$ to $\frac{3}{4}$ line long, ovate-oblong, obtuse, the 2nd nearly as long as the 3rd, 3 or 5-nerved, the margins ciliate, the 3rd rather longer, very prominently 3-nerved, ciliate with rigid hairs proceeding from a row of prominent tubercles. Flowering glume narrow, acute.—*Bail. Ill. Mono. Gr. Q.* i.

Hab.: Rockhampton, *O'Shanesy*; Herbert's Creek, *Bowman*; Warwick, *Beckler*; also in *Leichhardt's* collection.

4. ***P. papposum*** (furnished with pappus), *R. Br. Prod.* 192; *Benth. Fl. Austr.* vii. 468. Stems from a woolly or silky-villous rhizome 2ft. high or more. Leaves flat, usually long and narrow, the lower ones softly pubescent, the upper ones more glabrous; ligula rather long, membranous. Panicle-branches numerous, slender or filiform, spreading, 6 to 8in. long, the lower ones verticillate, the upper ones alternate and distant. Spikelets in distant pairs, both on capillary pedicels, one pedicel much longer than the other but both long, sometimes 1 to 2in. at the base of the branches, the upper pedicels shorter and sometimes solitary. Spikelets scarcely 1 line long, covered in the typical form with long silky hairs spreading when in fruit. Outer glume minute or sometimes wanting, 2nd and 3rd equal, 3-nerved, both empty or the third with a rudimentary palea. Fruiting glume rather acute, smooth and shining.

Var. *leiostachyum*. Spikelets glabrous, otherwise quite similar.—*P. autumnale*, *F. v. M. Fragm.* viii. 196, but not of *Bosc*.

Hab.: Sweers Island, *Henne*.

5. ***P. sanguinale*** (bloody), *Linn.*; *Kunth, Enum.* i. 82; *Benth. Fl. Austr.* vii. 469. Summer Grass. Decumbent and often shortly creeping and rooting at the base, ascending to 1 to 8ft. or rather more. Leaves flaccid, flat, usually pubescent and sprinkled with long hairs especially on the sheaths, but sometimes

nearly glabrous. Spikes or panicle-branches 3 to 8, crowded at the end of a long peduncle, all from nearly the same point or shortly distant, $1\frac{1}{2}$ to 8 in. or in some varieties about 4 in. long, the rachis slender but angular, flexuose, scabrous-ciliate. Spikelets in pairs, one nearly sessile the other pedicellate, oblong, rather acute, about $1\frac{1}{2}$ line long. Outer glume minute, rarely above $\frac{1}{4}$ line long, 2nd glume lanceolate, 8-nerved, from $\frac{1}{2}$ to $\frac{3}{4}$ the length of the spikelet, 3rd glume usually 5-nerved, glabrous or ciliate, empty. Fruiting glume shorter, smooth.—Trin. Spec. Gram. t. 98, 144; Duthie Ind. Gr. viii. ix.; Vasey Ag. Gr. U.S.; Turn. Ag. Gaz. N.S.W. ii. Pl. xxi.; *Digitaria sanguinalis*, Scop.; Reichb. Ic. Fl. Germ. t. 27.

Hab.: Rockhampton and neighbourhood, O'Shanesy, Bowman and others; Brisbane River, Moreton Bay, F. v. Mueller, Bailey and others.

A common weed in most warm countries.

6. **P. tenuissimum** (very slender), Benth. Fl. Austr. vii. 470. Erect, very slender, much branched at the base, often above 1 ft. high. Leaves short and narrow, quite glabrous, the ligula short scarious and jagged. Spikes or panicle-branches few, usually 3, filiform, spreading, distant, 1 to $1\frac{1}{2}$ in. long. Spikelets in pairs, ovoid, quite glabrous, but little more than $\frac{1}{2}$ line long, both pedicellate, but one pedicel twice as long as the other. Outer glume minute, almost microscopic, orbicular, the 2nd and 3rd nearly equal, both empty, obtuse, membranous, 3 to 5-nerved. Fruiting glume rather acute, usually slightly exceeding the empty ones.

Hab.: Brisbane River, Moreton Bay, F. v. Mueller; Rockhampton, O'Shanesy.

7. **P. parviflorum** (flowers small), R. Br. Prod. 192; Benth. Fl. Austr. vii. 470. A tall but slender usually glabrous grass. Leaves long and narrow, the ligula scarious, often long, jagged at the end. Panicle branches from 2 to numerous, spreading, simple, filiform, 2 to 4 in. or in some specimens 5 to 6 in. long, the lower ones distant, the upper ones often crowded. Spikelets ovoid, glabrous, $\frac{1}{2}$ to $\frac{3}{4}$ line long, mostly in pairs along the flexuose rachis, one on a longer pedicel than the other; but in the lower part of the branch often clustered, the longer pedicel bearing 2 or 3 spikelets. Outer glume very small, ovate, usually 1-nerved, 2nd and 3rd glumes nearly equal, both empty, membranous, obtuse, the 2nd usually 3-nerved, the 3rd 5-nerved. Fruiting glume as long, more acute, smooth.—Bail. Ill. Mono. Gr. Q. i., Turn. Ag. Gaz. N.S.W. ii.

Hab.: Rockhampton, O'Shanesy, Thozet; Brisbane River.

A very common grass on the sides of Southern hills.

Var. *pilosa*, more or less hairy.

Hab.: Moreton Bay and Brisbane River, Bailey.

8. **P. Baileyi** (after F. M. Bailey), Benth. Fl. Austr. vii. 471. A glabrous rather slender grass of $1\frac{1}{2}$ to 2 ft., with the inflorescence of *P. parviflorum*, but the spikelets rather of *P. dicaricatisimum*. Leaves flat, narrow, the ligula shortly prominent, scarious, not ciliate. Panicle of several simple filiform branches of 3 or 4 in., all distant or the upper ones rather crowded or the lower ones sometimes clustered, not verticillate. Spikelets narrow-ovoid, rather acute, nearly 1 line long, mostly in pairs, one on a much longer pedicel than the other, or in the lower part of the branch the longer pedicel with 2 or 3 spikelets. Outer glume very small, ovate, 1-nerved, the 2nd and 3rd glumes nearly equal, fringed with rather long hairs spreading when in fruit, the 2nd usually 5-nerved, the 3rd rather broader and 7-nerved. Fruiting glume acute, smooth and shining.

Hab.: Port Curtis, McGillivray; Brisbane River, Bailey.

9. **P. gibbosum** (swollen), R. Br. Prod. 198; Benth. Fl. Austr. vii. 471. Erect, branching at the base, 1 to $1\frac{1}{2}$ ft. high. Leaves narrow, erect, glabrous except a few hairs at the orifice of the sheaths. Panicle simple, spikelike, slender

but dense, 2 to 8 in. long, with a flexuose rhachis, or very rarely 2. spike-like erect branches. Spikelets in pairs along the rhachis, one sessile the other pedicellate or 3 to 6 together in cluster or on short branches at the base of the spike, all narrow, silky-hairy, about 1 line long, with a few long cilia usually at their base, or on the pedicel. Outer glume deficient; empty glumes 2, covered with long silky hairs, the lowest lanceolate, very thin and nerveless, the outer rather longer, ovate, very thin but distinctly 3 or 5-nerved. Fruiting glume hard, smooth, somewhat gibbous at the base, with a rather prominent keel.—Kunth, Revis. Gram. t. 105; F. v. M. Fragm. viii. 155.

Hab.: Rockhampton, O'Shanesy; Etheridge, W. E. Armit.

A variable plant scarcely to be distinguished from the simple spiked forms of *P. leucophæum*, except by the apparently total absence of the minute outer glume, and in this respect this species closely connects *Panicum* with *Paspalum*. Its close affinity to *P. leucophæum* prevents its removal from the former genus.—Benth.

10. ***P. leucophæum*** (red colour of glume showing through light-coloured hairs), *H. B. et K. Nov. Gen. et Sp.* i. 97; *Benth. Fl. Austr.* vii. 472. Stems from a branching base 1 to 2 ft. high. Leaves narrow, long or short, usually glabrous. Panicle of few long slender and erect spike-like branches, very unequal and sometimes reduced to 2 nearly equal ones or to a single one, the longest 3 to 6 in. long; secondary branches short, slender, erect, the lower ones with 4 or 5 sessile or pedicellate spikelets, the upper ones with only 1 or 2. Spikelets scarcely $1\frac{1}{2}$ line long, rather acute, densely covered with long silky, silvery or purple hairs, often spreading when in fruit. Outer glume scarcely $\frac{1}{2}$ line long, obtuse, 2nd and 3rd glumes nearly equal and empty, both densely hairy, the 2nd usually 3-nerved, the 3rd 5-nerved. Fruiting glume shorter, smooth, rather acute and often slightly gibbous at the base.—Bail. Ill. Mod. Gr. Q. i.; Turn. Ag. Gaz. N.S.W. iv. Pl. i.; *P. villosum*, R. Br. Prod. 192; *P. Brownii*, Roem. and Schult. Syst. ii. 462; F. v. M. Fragm. viii. 155; *P. glareæ*, F. v. M. in *Linnaea*, xxv. 445; *P. laniflorum*, Nees in Hook. Lond. Journ. ii. 410.

Hab.: Keppel Bay and Broadsound, R. Brown; Rockhampton, O'Shanesy; Rockingham Bay, Dallachy. Very common.

Fibrous under part of leaf peeled off when young, twisted and used to make twine.—Cloncurry, Palmer.

Also in tropical America and Africa.

11. ***P. rarum*** (spikelets distant), R. Br. Prod. 189; *Benth. Fl. Austr.* vii. 478. Stems slender, branching and sometimes creeping at the base, ascending to about 1 ft. Leaves very narrow, glabrous or the lower sheaths slightly hispid. Spike simple, slender, 2 to 4 in. long. Spikelets mostly singly sessile and distant, but sometimes in pairs at the base of the spike, one sessile the other pedicellate, all ovoid, obtuse, 1 line long or rather more, glabrous. Outer glume broad, 3 or 5-nerved, about half as long as the spikelet, 2nd and 3rd nearly equal, both membranous, 5-nerved, empty. Fruiting glume acute, transversely rugose, seated on a semi-annular cartilaginous disk.—Kunth, Rev. Gram. t. 15.

Hab.: Etheridge, W. E. Armit.

12. ***P. argenteum*** (silvery), R. Br. Prod. 190; *Benth. Fl. Austr.* vii. 478. Stems erect, under 1 ft. high. Leaves short, flat, softly pubescent. Panicle of few (3 to 5) erect slender distant branches, the rhachis almost filiform. Spikelets few, distant, erect, broadly turbinate and as it were truncate, about 1 line long, crowned by long silvery hairs. Outer glume not half the length of the spikelet, ovate, silky-hairy; 2nd and 3rd glumes both empty and similar, very broad and almost truncate, membranous, nerveless and silky-pubescent in the lower half, several-nerved with silvery-white rather long hairs at the end. Fruiting glume ovoid-oblong, glabrous, smooth.—Trin. Spec. Gram. t. 170.

Hab.: Islands of the Gulf of Carpentaria, R. Brown.

The analytical details in Trinius' plate appear to be taken from the *P. holosericeum*, they do not at all agree with the spikelets examined of Brown's *P. argenteum*.—Benth.

13. **P. holosericeum** (all silky), *R. Br. Prod.* 190; *Benth. Fl. Austr.* vii. 478. Stems from a branching base, erect, slender, mostly under 1ft. high, more or less hairy as well as the foliage. Leaves short, narrow, acute, very spreading, the nerve-like margins usually undulate. Panicle of few (4 to 6) erect simple distant branches, the longest about $\frac{3}{4}$ in. long. Spikelets usually 5 or 6, alternate, under $1\frac{1}{2}$ line long but appearing longer from the long shining silvery-silky hairs with which they are covered. Outer glume acute, more than half the length of the spike, 2nd glume acute, mucronate, 3-nerved towards the end, 3rd glume nearly similar and empty but rather longer, 5-nerved at the end, with a longer point; fruiting glume much shorter, glabrous, distinctly 8-nerved at the end, with a short point, at length hardened and minutely striate.—Kunth, *Rev. Gram.* t. 18; *Trin. Spec. Gram.* t. 178.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*.

14. **P. flavidum** (yellow), *Retz. Obs.* iv. 15; *Benth. Fl. Austr.* vii. 474. Warrego Summer Grass. Stems erect, branching at the base, rather rigid, attaining 1 to 2ft. or rather more. Leaves acute, sometimes rather broad but the margins involute when dry, glabrous except a few short hairs at the orifice of the sheath. Panicle of several often numerous erect distant branches or sessile spikes, the lowest sometimes above $\frac{3}{4}$ in. long, the upper one shorter, the rhachis flexuose, slightly dilated. Spikelets sessile in about 2 rows, in the typical form very oblique, ovoid, about $1\frac{1}{2}$ line long or rather more in some specimens. Outer glume very short, broad and obtuse, the second glume the largest, broad, several-nerved, very concave and incurved, the third smaller, flat on the back, enclosing a palea large and broad in the typical form but no stamens. Flowering glumes usually shortly acuminate.—*R. Br. Prod.* 190; *Duthie Ind. Gr. pl. vi.*; *Bail. in Mono. Gr. Q. i.*; *Turn. Ag. Gaz. N.S.W.* iv. Pl. xi.; *P. brizoides*, *Jacq. f. Ecl. Gram.* 2, t. 2, *Trin. Spec. Gram.* t. 158.

Hab.: Herbert's Creek, *Bowman*; Peak Downs, *Barkitt*; Springsure, *Wuth.*

Var. *tenuior*. Spikelets rather small, not quite so oblique, the palea within the third glume usually very small, the fruiting glume very rugose.—*Turn. Ag. Gaz. N.S.W.* iv. Pl. xii.

Hab.: Endeavour River, *Banks and Solander*; Warwick, *Beckler*.

15. **P. gracile** (slender), *R. Br. Prod.* 190; *Benth. Fl. Austr.* vii. 475. Erect, much branched towards the base, quite glabrous, usually slender, from under 1ft. to above $1\frac{1}{2}$ ft. high, but exceedingly variable in stature and aspect. Leaves from very narrow to rather broad. Panicle usually long and slender, the branches or sessile spikes or clusters erect, distant, the lower ones 3 to 4 lines or rarely $\frac{1}{2}$ to 1 in. long, the upper ones smaller, often reduced to short clusters or to single spikelets towards the end of the panicle, the rhachis of the branches often but not always produced beyond the last spikelet into a point sometimes as long as the spikelet. Spikelets singly sessile or in pairs, one pedicellate the other sessile along the rhachis, rarely more or less distinctly in 2 rows almost as in *P. flavidum*, ovoid, 1 to $1\frac{1}{2}$ line long, nearly straight, the outer glume, ovate acute, rather less or more than half as long as the spikelet, the second and third nearly equal, both empty membranous and about 5-nerved, fruiting glume as long or rather longer, minutely transversely rugose.—*Turn. Ag. Gaz. N.S.W.* iii. Pl. xxi.

Hab.: Keppel Bay, *R. Brown*, an elongated form with very narrow leaves, and the spikelets irregularly arranged almost clustered on the lower branches; Rockingham Bay, *Dallachy*, and numerous localities in southern Queensland, *O'Shanesy*, *Thozet*, *Bowman* and others, and a var. with very small spikelets; Herbert's Creek, *Bowman*.

16. **P. jubiflorum** (referring to the long top or inflorescence), *Trin. Gram. Panic. Diss.* ii. 1501; referred to in *Flora Austr.* vii. 475. This excellent fodder grass seems to hold a position between *P. flavidum*, *Retz.*, and *P. gracile*, *R. Br.*, and probably should be placed as a named variety of the latter. It is a glabrous leafy grass, with numerous erect stems of 3 or 4ft. in height, the terminal

inflorescence occupying about one quarter of the stems length. The spikes arranged as in *P. gracile*, but longer, and the spikelets larger.—*P. distans*, Trin. Spec. Gram. t. 172.

Hab.: Darr River, C. W. de Burgh Birch; Georgina River, J. Coghlan.

17. **P. prostratum** (prostrate), Lam. Illustr. i. 171; Benth. Fl. Austr. vii. 476. Stems decumbent or creeping and rooting at the base, ascending to 1ft. or more. Leaves lanceolate, 1 to 2in. long or in luxuriant specimens twice as long, glabrous except a few cilia at the base of the lamina and orifice of the sheath, or sometimes with the sheath more hairy. Panicle of 8 to 10 simple branches 1 to 1½in. long, usually crowded at the end of the peduncle, but sometimes more distant and spreading. Spikelets rather crowded along the rhachis, but often in pairs, 1 sessile the other pedicellate, or rarely the lower pedicels bearing 2 spikelets, ovoid, rather above 1 line long and almost acute, glabrous but occasionally with a few capillary bristles on the rhachis and pedicels. Outer glume very short and broad, obtuse or almost acute, the 2nd and 8rd nearly equal, 8 or 5-nerved, the 3rd with a large palea and sometimes a male flower in its axil. Fruiting glume smooth, very obtuse, but occasionally tipped by a minute point. Trin. Spec. Gram. t. 184, 185.

Hab.: Gulf of Carpentaria, Landsborough.

Generally distributed over tropical Asia, it is also in Africa and the West Indies.

18. **P. *muticum** (pointless), Forsk. Fl. Arg. Arab. 20. Stems stout, elongating to 8ft. or more, the nodes more or less softly bearded. Leaves 6 to 12in. long, the sheath glabrous or hairy; ligula short, ciliate. Panicle erect, 8 to 5in. long, rhachis stiff, scabrous. Spikes rather distant, stout, simple or divided below, lower ones 2 to 4in. long, upper gradually shorter, rhachis sub-hispid. Spikelets turgid, sometimes solitary and alternate, green or purplish, 1st glume a ½ of the 8rd, ovate, acute, 1-nerved, 2nd and 8rd subequal, 5-nerved, 8rd paleate male, 4th ellipsoid obtuse margins narrowly incurved.

Hab.: Found in Java, Africa and America. Was introduced by the late Dr. Joseph Bancroft, and is becoming naturalised; yields a large quantity of fodder when growing on damp or swampy land.

19. **P. helopus** (growing in swamps), Trin. in Spreng. Neue Entd. ii. 84; Benth. Fl. Austr. vii. 476. Stems usually rather tall. Leaves lanceolate, often rather broad and cordate at the base with loose sheaths, usually more or less hirsute especially the sheath, but sometimes nearly glabrous. Panicle of few simple branches, sometimes 8 to 5 almost sessile above the last leaf, sometimes 6 or 7 on a rather long peduncle. Spikelets irregularly alternate in 2 rows along the rhachis, or the lower ones clustered and the upper ones more distant, ovoid, acute, nearly 2 lines long, pubescent villous or glabrous. Outer glume very short and broad, 8-nerved, the 2nd about 7-nerved, the 8rd about the same length but narrower, 5-nerved, with a palea in its axil but no stamens. Fruiting glume minutely rugose, obtuse, but the central-nerve produced into a short awn-like point not exceeding the empty glumes.—Trin. Spec. Gram. t. t. 188; Duth. Ind. Gr. pl. vii.; *Urochloa pubescens*, Beauv.; Kunth, Enum. i. 74; *U. panicoides*, Beauv. Agrost. 52, t. 11; Kunth, l.c. and Revis. Gram. t. 14.

Hab.: Islands of Torres Strait; Darling Downs and other southern localities.

The species is common in tropical Asia and Africa.

20. **P. Gilesii** (after Ernest Giles), Benth. Fl. Austr. vii. 477. Stems 6 to 10in. high, leafy to the top, with a few long hairs scattered on the leaf-sheaths, the lamina flat. Panicle of 2 or 3 simple branches, close together and half enclosed in the uppermost leaf-sheath, under 1in. long. Spikelets closely resembling in size and shape those of *P. helopus*, ovoid, acute or acuminate, 1½ line long or rather more, sessile in 2 rows on a glabrous rhachis. Outer

glume minute, hyaline, concealed by the long hairs which cover it; 2nd glume prominently 7-nerved, acute or acuminate, shortly hairy; 3rd about the same length, 3 or 5-nerved, bordered on each side below the middle by long spreading hairs, with a broad hyaline palea in its axil; fruiting glume much shorter, coriaceous, obtuse with the point or short awn of *P. helopus*.

Hab.: Inland localities.

21. ***P. piligerum*** (bearing hairs), *F. v. M.*; *Benth. Fl. Austr.* vii. 477. Closely resembles some of the longer more hairy specimens of *P. helopus*. Leaves rather narrow, 6 to 8 in. long. Panicle of 3 to 5 erect simple branches 1 to near 2 in. long. Spikelets ovoid, acute, nearly 2 lines long, alternate along the rachis but rather distant so as to appear in a single row. Glumes hairy, the outer one short, 3-nerved; 2nd and 3rd glume 5-nerved, the 3rd rather narrower than the 2nd but both empty and equal in length. Fruiting glume shorter, coriaceous, obtuse, without any or only a very minute and deciduous terminal point, minutely transversely rugose.

Hab.: Mackay, *L. J. Nugent*.

22. ***P. distachyum*** (2-spiked), *Linn.*; *Kunth, Enum.* i. 91; *Benth. Fl. Austr.* vii. 478. Stems decumbent or creeping and rooting at the lower nodes, slender and ascending to 1 ft. or rather more. Leaves flat, glabrous or with a few hairs especially at the orifice of the sheaths. Panicle of few (usually 2 to 4 but occasionally 6 or 7) distant simple secund branches 1 to 2 in. long, at first erect, at length spreading or reflexed, the rachis slender or slightly dilated, often sprinkled with a few hairs. Spikelets sometimes loosely alternate along the rachis almost in a single row, sometimes more numerous and approximate in 2 distinct rows, sessile or shortly stipitate, ovoid, rather acute, $1\frac{1}{2}$ line long, quite glabrous. Outer glume scarcely half the length of the spikelet, thin, very broad, the margins overlapping each other, 2nd and 3rd glumes nearly equal, prominently 3-nerved; a narrow palea in the 3rd. Fruiting glume nearly as long, very obtuse, hardened but the three nerves very visible.—*Bail. Ill. Mono. Gr. Q. i.*; *Turn. Ag. Gaz. N.S.W.* iii. Pl. xlv.; *P. subquadruparum*, *Trin. Spec. Gram.* t. 186 (with a loose sparing inflorescence).

Hab.: Rockhampton, *O'Shaney*; Bokhara Flats, *Leichhardt*; Brisbane River. Widely distributed over East India and the Malayan Archipelago.

23. ***P. reversum*** (reversed), *F. v. M. Fragm.* viii. 152; *Benth. Fl. Austr.* vii. 478. A weak glabrous rather glaucous much-branched grass. Leaves long and narrow. Panicle usually of 3 or 4 simple distant branches, at first erect but soon spreading, and at length reflexed like those of *P. distachyum*, but the rachis generally though not always dilated, produced into a rigid point beyond the last spikelet, and bearing under the lowest spikelet a rigid linear bristle (an abortive branch?) as long as the spikelet. Spikelets not numerous, alternate and distant along the rachis so as to appear in one row, ovoid-oblong, fully 2 lines long in some specimens, rather under in some others. Outer glume 3-nerved, obtuse, at least $\frac{2}{3}$ the length of the spikelet, 2nd and 3rd glumes equal, many-nerved, usually both empty but sometimes with a palea in the 3rd. Fruiting glume hardened as in the genus.—*Maid. Gr. N.S.W.* 37.

Hab.: An inland grass.

This species seems to show some distant approach in inflorescence to the *Plagiosetum refractum*.—*Benth.*

24. ***P. colonum*** (cultivated), *Linn.*; *Benth. Fl. Austr.* vii. 478. Stems erect or decumbent at the base, 2 ft. high or more. Leaves flat, glabrous. Panicle of several (about 8 or 10) simple one-sided distant and usually erect branches or sessile spikes, $\frac{1}{2}$ to $\frac{3}{4}$ in. long, and not diminishing much upwards. Spikelets

about 1 line long, ovoid, sessile and densely crowded in about 4 rows, the rhachis without bristles but occasionally a few small empty scales (abortive spikelets?) at the base of the spike. Outer glumes coarsely pubescent or nearly glabrous, the lowest nearly half as long as the 2nd and 3rd, which are nearly equal, often ending in short points but not awned; a palea in the 3rd glume. Fruiting glume smooth and shining.—Trin. Spec. Gram. t. 160; Duth. Ind. Gr. pl. iv.; *Oplismenus colonum*, Kunth Enum. i. 142.

Hab.: On the inland downs.

Common in the tropical and subtropical regions of the Old World and in many parts of America.

25. **P. crus-galli** (Cock's-shank), Linn.; Benth. Fl. Austr. vii. 479. A coarse decumbent annual, ascending to 1 or 6ft., the leaves rather broad, without any ligula. Panicle dense and usually secund, of simple branches or sessile spikes, the lowest 1 to 2in. long, the upper ones gradually shorter, the whole panicle in some varieties densely hispid with the long purplish or green awns. Spikelets about $1\frac{1}{2}$ line long, more or less pubescent, acuminate or awned, crowded and clustered along the branches, the rhachis usually bearing numerous cilia or capillary bristles amongst or below the spikelets. Outer glume very short and broad, 2nd and 3rd glumes nearly equal and 3-nerved, usually ciliate on the margins, the 2nd produced into a rather short awn, the 3rd with an awn varying from $\frac{1}{2}$ to 1in., and a thin palea and very rarely a male flower in its axil. Fruiting glumes smooth and shining, without any or only a very short point.—R. Br. Prod. 191; F. v. M. Fragm. viii. 198; Trin. Spec. Gram. t. 161, 162; Duth. Ind. Gr. Pl. v.; Bail. Ill. Mono. Gr. Q. i.; Vasey Ag. Gr. U.S.; Turn. Ag. Gaz. N.S.W. ii. Pl. xx.; *Oplismenus crus-galli*, Kunth, Enum. i. 143; *Echinochloa crus-galli*, Beauv.; Reichb. Ic. Fl. Germ. t. 29.

Hab.: Port Moller, A. Cunningham; Port Denison, Fitzalan; Brisbane River, Moreton Bay, F. v. Mueller and others; Rockhampton and neighbourhood, O'Shanesy and others.

A common weed in most hot and some temperate countries.

The common form in Queensland is the long-awned variety *sabulicolum*, which attains the height of 4 to 6ft., and is an excellent fodder. The awns all long and dark-coloured on the first growth but when fed off, on the second growth the awns are often wanting.

26. **P. myosuroides** (Myosurus-like), R. Br. Prod. 189; Benth. Fl. Austr. vii. 480. Erect or slightly decumbent at the base, often 2ft. high. Leaves long and narrow, glabrous. Spikelets ovoid, obtuse, $\frac{1}{2}$ to $\frac{3}{4}$ line long, clustered and crowded in a continuous and dense cylindrical spike or spikelike panicle 1 to 4in. long and not above 2 lines diameter, often dark-coloured. Outer glume ovate, acute or acuminate, about half the length of the spikelet, 3-nerved; 2nd and 3rd glumes nearly equal, broad, 5 or 7-nerved; a minute palea in the axil of the 3rd.—P. angustum, Trin. Spec. Gram. t. 331.

Hab.: Endeavour River, Banks and Solander, A. Cunningham; Dawson River, F. v. Mueller.

The species extends over tropical Asia and Africa, but is less common than the *P. indicum*, with which it is united in the Hong Kong Flora and by F. v. M. Fragm. viii. 197. It appears, however, to be constantly distinct in the very small obtuse spikelets with straight glumes very rarely and only slightly ciliate.—Benth.

27. **P. indicum** (of India), Linn.; Kunth, Enum. i. 133; Benth. Fl. Austr. vii. 480. Stems decumbent at the base, ascending to 6 or 8in. in the smaller varieties, above 1ft. high in the larger ones. Leaves narrow. Spikelike panicle cylindrical, continuous or rarely interrupted, $\frac{1}{2}$ to 1in. or in some varieties 2in. long. Spikelets crowded, narrow, acuminate and more or less curved, 1 to $1\frac{1}{2}$ or rarely nearly 2 lines long. Outer glume 3-nerved, about $\frac{1}{2}$ the length of the spikelet or rather more, 2nd glume curved and gibbous at the base, often ciliate,

7 or 9-nerved, 8rd glume the same length but straighter and neither gibbous nor ciliate, with a small palea in its axil; fruiting glume considerably shorter.—F. v. M. *Fragm.* viii. 197; *Trin. Spec. Gram.* t. 197.

Hab.: Between Norman and Gilbert Rivers, *Gulliver*; Endeavour River, *Banks and Solander*; Wide Bay and Brisbane River, *Leichhardt*; Moreton Bay, *C. Stuart*.

Widely dispersed over tropical Asia and Africa. *P. phleoides*, R. Br. *Prod.* 139, is almost exactly the typical form represented in Herb. Linn., small and slender, with a short spike of $\frac{1}{2}$ to 1 in. and rather small spikelets. *P. arcuatum*, R. Br. l.c. is the largest perhaps the most common form, with rather larger more curved spikelets, in a spike of 1 to 2 in. The two run very much into each other.—*Benth.*

28. ***P. myurus*** (like a rat's-tail), *Lam.*; *Kunth, Enum.* i. 86; *Benth. Fl. Austr.* vii. 480. A tall grass, the lower part when under water often thick, more or less flattened and rooting at the nodes, the upper part erect, 2 to 4 ft. high, quite glabrous. Leaves flat, the lower ones sometimes $\frac{1}{2}$ in. broad. Panicle cylindrical, dense and spikelike, or lobed and interrupted at the base, 8 in. to above 1 ft. long. Spikelets crowded along the short erect branches. Outer glume thin and hyaline, 1-nerved, mucronate-acute, under 1 line long, inserted (always?) at some distance below the others; 2nd glume 2 lines long, 3-nerved, tapering to a fine point, 3rd still longer with a longer point, 3 or 5-nerved, usually with a small palea in the axil. Flowering glume shorter, thin and hyaline at the time of flowering, slightly stiffened but not hardened round the fruit.—*Bail.* III. Mono. Gr. Q. i.; *Hymenachne myurus*, Beauv. *Agrost.* 49, t. 10, f. 8, and with some other species, *Nees Agrostol. Brasil.* 278; *P. interruptum*, Willd.; *Kunth, Enum.* i. 87.

Hab.: Trinity Bay, *Bailey*; Mackay, *L. J. Nugent*.

A rather common tropical grass in the New and the Old World.

As the water dries up in the swamps in which this grass grows, the running stems are greedily eaten by stock.

29. ***P. foliosum*** (leafy), *R. Br. Prod.* 191; *Benth. Fl. Austr.* vii. 481. Stems 1 to 2 ft. high, decumbent at the base. Leaves rather broad, usually pubescent, the nerve-like margins often undulate. Panicle loose, with few distant simple branches, the rachis flexuose and slender, the lower branches sometimes 2 to 3 in. long. Spikelets few, distant, almost sessile or distinctly pedicellate, and the lower pedicels sometimes bearing 2 spikelets, all above 2 lines long in the typical form, ovoid, acute, pubescent or glabrous. Outer glume about half as long as the spikelet, very broad, acute, with about 7 nerves, 2nd and 3rd glumes nearly equal, 5 or 7-nerved; a rather broad palea in the 3rd. Fruiting glume minutely rugose without the point of *P. helopus* and its allies, but usually with a short callous incurved lip.—F. v. M. *Fragm.* viii. 194.

Hab.: Bustard Bay, *Banks and Solander*; Keppel Bay, *R. Brown*; Rockhampton, *O'Shanesey, Thozet*; Moreton Bay, *F. v. Mueller, Leichhardt, C. Stuart*.

80. ***P. adspersum*** (scattered hairs), *Trin. Spec. Gram.* t. 169; *Benth. Fl. Austr.* vii. 481. Stems ascending to 1 ft. or rather more, glabrous except the ciliate nodes. Leaves flat, rather broad and short, the sheaths broader upwards, prominently ciliate, the lamina almost cordate at the base, with a very short ciliate ligula. Panicle narrow, rather dense, $1\frac{1}{2}$ to 3 in. long, with several erect or slightly spreading branches, all glabrous without any or with very few small cilia under the spikelets. Spikelets ovoid, rather acute, quite glabrous, $1\frac{1}{2}$ to near 2 lines long, crowded or clustered in the lower part of the branches, singly sessile towards the end. Outer glume $\frac{1}{2}$ to $\frac{1}{3}$ as long as the spikelet, rather acute, 1 or 3-nerved; 2nd and 3rd glumes nearly equal, the 2nd broad, usually prominently 7-nerved, the 3rd narrower, with about 5 nerves, and enclosing a long palea. Fruiting glume tipped with a minute point and minutely transversely rugose.—*Maid. Gr. N.S.W.* 48.

Hab.: Recorded for Queensland by *F. v. M.*

Trinius' plant is from San Domingo in the West Indies, and if it were not on the authority of Munro, I should have great hesitation in uniting with it this one from Central Australia, but I can find nothing to separate the specimens from these two distant regions, although Trinius's figure represents a much looser and less copious inflorescence than that of the Australian plant.—*Benth.*

81. **P. inaequale** (unequal), *F. v. M. Fragm.* viii. 189; *Benth. Fl. Austr.* vii. 482. Stems erect, 1 to 2ft. high. Leaves rather long and narrow, glabrous except a few hairs at the orifice and sometimes on the upper part of the sheaths. Panicle long and narrow, secund, the branches distant, the upper ones short and simple, the lower ones $\frac{1}{2}$ to 2in. long, slender, simple or with a few short branches and sometimes in pairs. Spikelets alternate along the rhachis, sessile or nearly so, quite glabrous, about $1\frac{1}{2}$ line long. Outer glume about $\frac{1}{2}$ the length of the spikelet, very broad and obtuse, prominently 5 or 7-nerved, the 2nd glume about twice the length of the lowest and half the 3rd, very broad and obtuse, prominently 9 to 13-nerved; 3rd glume many-nerved like the 2nd but more acute, grooved on the back, the margins inflexed or involute, with a large palea in its axil. Fruiting glume shorter, acuminate, more or less curved, contracted at the base, transversely rugose.

Hab.: Mackay and Dawson River, *F. v. Mueller*; Herbert's Creek, *Bowman*.

In the latter specimens the rhachis of the panicle-branches is sometimes produced beyond the last spikelet into a short awn-like point almost as in *Chamaraphis*.—*Benth.*

82. **P. uncinulatum** (hooked), *R. Br. Prod.* 191; *Benth. Fl. Austr.* vii. 482. Glabrous erect and much branched, attaining sometimes 8ft. (*F. v. Mueller*), the nodes often much thickened. Leaves flat, narrow, tapering into fine points. Panicle terminal, loose and slender, consisting of few distant spreading simple or scarcely divided branches, the rhachis almost filiform. Spikelets few and distant along the branches, usually purplish, $2\frac{1}{2}$ to 3 lines long. Outer glume lanceolate, about half the length of the spikelet, the 2nd and 3rd nearly equal, acutely acuminate, 7 or sometimes 9-nerved, sprinkled with short erect rigid hooked hairs; a small palea in the 3rd. Fruiting glume smaller, quite smooth.

Hab.: East Coast, *R. Brown*; Wide Bay, *Leichhardt*; Burnett River, *F. v. Mueller*; Herbert's Creek, *Bowman*; Rockhampton, *C'Shanesy*, *Thozet*; Warwick, *Beckler*.

83. **P. pauciflorum** (flowers few), *R. Br. Prod.* 191; *Benth. Fl. Austr.* vii. 483. A low much-branched grass, more or less sprinkled with long spreading hairs, rarely quite glabrous. Leaves narrow, with short sheaths, the ligula very short or scarcely prominent, ciliate. Panicles in the axils of the numerous floral leaves, often scarcely exceeding them, reduced to very few unequal spreading capillary branches, each bearing 1 to 3 spikelets, all pedicellate glabrous, acute, about 2 lines long. Outer glume broad, fully half as long as the spikelet, acute, 3 or 5-nerved; 2nd and 3rd nearly equal, acutely acuminate, finely 5 or 7-nerved; a minute palea in the 3rd. Fruiting glume oblong, rather acute, smooth and shining, not much above half the length of the other glumes, but raised above them by a stipes or prolongation of the rhachis bordered under the spikelet by a broad short hyaline membrane.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*.

84. **P. repens** (creeping), *Linn.*; *Kunth, Enum.* i. 103; *Benth. Fl. Austr.* vii. 484. Stems from a creeping and rooting base ascending to 1 or 2ft., rather stiff, the nodes glabrous. Leaves narrow, more or less pubescent or hairy or sometimes quite glabrous; ligula short, ciliate. Panicle narrow, with a few long branches, erect or at length spreading, the spikelets shortly pedicellate, irregularly crowded on short secondary branches, with a filiform flexuose rhachis. Spikelets $1\frac{1}{2}$ line long, glabrous or the nerves of the glumes minutely ciliate. Outer glume less than $\frac{1}{2}$ the length of the spikelet, acute, 1-nerved;

2nd and 3rd glumes nearly equal, acute or acuminate, prominently 8 or 5-nerved, a male flower in the 3rd. Fruiting glume acute, smooth or minutely rugose.—*P. arenarium*, Brot. Phyt. Lusit. i. 15, t. 6; *P. airoides*, R. Br. Prod. 190.

Hab.: Gulf of Carpentaria, R. Brown, *F. v. Mueller*; Sweers Island, Henne; Endeavour River, Banks and Solander.

The species is common in maritime districts in southern Asia, northern Africa and southern Europe, and apparently also on the coasts of Brazil.

85. *P. *maximum* (from its large size), *Jac. Ic. Pl. Rar. i. t. 13*; *Hook. in Fl. Brit. Ind. vii. 49*. Guinea Grass. A perennial grass 8 to 10ft. high with branching stems. Leaves 1 to 2ft. long with long filiform points, the sheaths hairy; ligula of long hairs. Panicle large and loose, with numerous capillary much divided branches. Spikelets numerous, all pedicellate, $1\frac{1}{2}$ to $1\frac{1}{2}$ line long, obtuse. Glumes membranous and obtuse, the outer one about $\frac{1}{2}$ the 2nd and 3rd. A male flower in the 3rd. Fruiting glume acute, slightly rugose.—*P. jumentorum*, Pers.; Vasey Ag. Gr. U.S.

Hab.: Tropical Africa. An excellent fodder cultivated in most tropical countries.

86. *P. pygmaeum* (dwarfish), *R. Br. Prod. 191*; *Benth. Fl. Austr. vii. 484*. A small species, creeping and rooting at the nodes, ascending to about 6in. Leaves rarely above 1in. long, linear or lanceolate, ciliate and usually but not always sprinkled with long hair. Panicle short and spreading, with a few capillary flexuose simple or slightly divided branches. Spikelets few and distant, scarcely 1 line long, obtuse, glabrous. Outer glume very short, broad, truncate, nerveless; 2nd and 3rd glumes equal, 8 or 5-nerved, both empty. Fruiting glume smooth and shining.—*F. v. M. Fragm. viii. 198*; *Maid. Gr. N.S.W., 45*.

Hab.: Brisbane River, Moreton Bay, *F. v. Mueller, Bailey*; Cleveland Bay, *Gulliver*.

87. *P. trichoides* (Trichodium-like), *Sw.; Kunth, Enum. i. 112*; *Benth. Fl. Austr. vii. 485*. Decumbent at the base and often shortly creeping and rooting, though sometimes apparently annual, the stems slender, ascending to from 6in. to nearly 1ft. Leaves ovate-lanceolate or rarely narrow, cordate and ciliate at the base, the sheaths also often slightly hairy. Panicle at first sessile within the last leaf, but at length pedunculate, decomposed with numerous capillary flexuose divided spreading branches, the lower ones clustered, the whole panicle ovate in outline 2 to 4in. long, and often almost as broad, glabrous, or with a few long hairs scattered on the main rhachis. Spikelets almost the smallest in the genus, ovoid, obtuse, scarcely more than half line long. Outer glume scarcely $\frac{1}{2}$ the length of the spikelet, ovate, acute, 1-nerved; 2nd and 3rd nearly equal, broadly ovate, 3-nerved, shortly hirsute; a small palea sometimes but not always in the 3rd. Fruiting glume smooth and shining.

Hab.: Found on hillsides in tropical localities.

88. *P. hermaphroditum* (hermaphrodite), *Steud. Syn. Glum. i. 67*; *Benth. Fl. Austr. vii. 485*. Stems creeping and rooting at the base, ascending to 1ft. or more, rather slender. Leaves spreading, lanceolate or almost linear, sprinkled especially the lower ones with rather long hairs. Panicle narrow, rather dense, $1\frac{1}{2}$ to 3in. long, the short capillary branches much divided, with few or many long hairs on the rhachis and branches. Spikelets very numerous, all pedicellate, usually of a dark brown, obliquely ovoid, under $\frac{2}{3}$ line long and broad. Empty glumes all broad and 3-nerved, the outer one more than half the length of the spikelets, the 2nd very broad and gibbous, the 3rd rather longer and straight. Fruiting glume very hard and smooth, broad and very gibbous. Palea also hard and smooth, projecting laterally from the glume more than in any other species.—*P. pilipes*, Nees in *Pl. Wight, Exs. n. 2348*.

Hab.: Daintree River and other tropical scrubs.

The species is also in Ceylon, the East Indian Peninsula and the Malayan Archipelago.

39. **P. marginatum** (margined), *R. Br. Prod.* 190; *Benth. Fl. Austr.* vii. 485. A rather slender but often rigid grass, decumbent branching and often rooting at the base, ascending to 1ft. or more; glabrous except the cilia at the orifice of the sheaths, and the rhachis of the inflorescence often slightly pubescent. Leaves flat, usually narrow, but exceedingly variable in size. Panicle narrow, in the typical form $1\frac{1}{2}$ to 8in. long, of few erect or scarcely spreading simple or slightly divided branches. Spikelets irregularly crowded along the branches or sometimes almost in a single row, ovoid, ~~obtus~~, or scarcely acute, about $1\frac{1}{2}$ line long. Outer glume very thin, not $\frac{1}{3}$ the length of the spikelet, 1-nerved or faintly 8-nerved; 2nd and 3rd glumes nearly equal and similar, both empty membranous, 3 or 5-nerved, glabrous. Fruiting glume rather shorter, slightly hardened and densely silky-pubescent or villous as well as the exposed part of the palea.—*Trin. Spec. Gram.* ii. t. 209; *F. v. M. Fragm.* viii. 190; *Sieb. Agrostoth.* n. 69; *Maid. Gr. N.S.W.* 46.

Hab.: Wide and Moreton Bays, *F. v. Mueller*, *Leichhardt* and others; Rockhampton, *O'Shanessy*.

Var. *majus*. Stems tall, with broad leaves 6in. long, the lower branches of the panicle 3 or 4in. and the spikelets above $1\frac{1}{2}$ line long.

Hab.: Chiefly in *Leichhardt's* collections.—*Benth.*

Var. *strictum*. Stems slender, rigid, much branched, with very short narrow leaves, the panicle narrow, very little branched, and sometimes reduced to a simple interrupted spike.—*P. strictum*, *R. Br. Prod.* 190; *Trin. Spec. Gram.* ii. t. 179; *Sieb. Agrostoth.* n. 71 and 90.

Amidst all its varieties which it sometimes seems difficult to unite, this species is readily known by the dense pubescence of the fruiting glume which has not been observed in any other *Panicum*. Some specimens seem to show that the *P. strictum* is rather an after-growth from plants that have been cut down, than a distinct variety.—*Benth.*

40. **P. lachnophyllum** (leaves woolly), *Benth. Fl. Austr.* vii. 486. A low decumbent grass, with ascending branches of 6 to 8in. Leaves very spreading, rather rigid, acute, softly pubescent on both sides, the sheaths softly villous, the ligula reduced to cilia. Panicle narrow, erect, not much branched, 1 to 2in. long. Spikelets very shortly pedicellate or almost sessile, ovoid, obtuse, rather under 1 line long. Outer glume small, ovate, rather acute, 2nd and 3rd glumes nearly equal, membranous, 5-nerved, both empty. Fruiting glume smooth and shining, but tipped with a slight pubescence.

Hab.: Moreton Bay. *C. Stuart*.

41. **P. obseptum** (a stoppage), *Trin. Gram. Panic. Diss.* ii. 149; *Benth. Fl. Austr.* vii. 486. A weak glabrous grass, decumbent at the base or creeping in the mud and shortly ascending. Leaves narrow, the ligula a ring of cilia. Panicle narrow and loose, 1 to 2in. long, of few simple or scarcely divided branches. Spikelets few, all pedicellate, the upper ones of each primary branch solitary, the lower ones 2 or 3 together on short secondary branches, all narrow-ovoid, 1 to $1\frac{1}{2}$ line long, quite glabrous, rather obtuse. Outer glume short, broad, nerveless, truncate or shortly acute, the 2nd and 3rd equal or nearly so, membranous, 5-nerved, both empty. Fruiting glume rather acute, smooth and shining.

Hab.: Islands of Moreton Bay to the border of N.S.W., near Wallangarra.

The shape of the spikelets and glumes would suggest that this might be a very reduced form of *P. decompositum*, but none of the rather numerous specimens show any tendency to a further development and there is no vestige of a palea in the 3rd glume.—*Benth.*

42. **P. Buncei** (after — Bunce), *F. v. M. Herb.*; *Benth. Fl. Austr.* vii. 487. A glabrous perennial of 1 to 2ft. Leaves long and narrow, the ligula prominent, bordered by a few long cilia. Panicle narrow, rather loose, not much branched, 3 to 4in. long, the branches filiform and flexuose. Spikelets several along the smaller branches, rather acute, nearly 2 lines long. Outer glume broad and loose, thin, almost truncate, 1 or 3-nerved, $\frac{1}{4}$ or $\frac{1}{3}$ the length of the

spikelet; second and third glumes nearly equal, membranous, 5 or 7-nerved, glabrous, the 3rd rather longer than the 2nd, with a broad acuminate rather rigid palea, but no stamens in any of the spikelets examined. Fruiting glume obtuse, about $\frac{1}{2}$ the length of the outer ones, smooth and shining.

Hab.: Bokhara Flats, *Leichhardt*.

I have some hesitation in proposing this species, which has much the aspect of a few specimens of *P. repens*, but there appears to be no male flower in the 3rd glume which I have invariably found in *P. repens*.—*Benth.*

43. ***P. bicolor*** (2-coloured), *R. Br. Prod.* 191; *Benth. Fl. Austr.* vii. 487. Usually a small slender tufted grass, with much the habit of some species of *Aira* or *Agrostis*, but sometimes above 1ft. high, approaching in habit the *P. melananthum*. Leaves linear, usually very narrow, more or less hairy especially at the orifice of the sheath, rarely quite glabrous, the ligula very short, ciliate. Panicle usually only 2 or 3in. long, loose and slender but rather narrow, but sometimes larger and spreading, the branches capillary and flexuose, not clustered and not much divided. Spikelets all pedicellate, about 1 line long, glabrous. Outer glume acute, 3-nerved, fully $\frac{1}{2}$ as long as the spikelet; 2nd and 3rd glumes nearly equal, acute, about 5-nerved, 3rd with a palea but no stamens. Fruiting glume smooth and shining.—*Turn. Ag. Gaz. N.S.W.* iii.

Hab.: Brisbane River, Moreton Bay, *F. v. Mueller, Bailey*; Rockhampton, *O'Shanesy*; Herbert's Creek, *Bowman*.

44. ***P. melananthum*** (flowers dark-coloured), *L. v. M. in Trans. Vict. Inst.* 1885, 47; *Benth. Fl. Austr.* vii. 488. A glabrous grass of 2 to 4ft. or more, decumbent at the base and perhaps annual. Leaves flat and rather broad, the ligula exceedingly short, ciliate. Panicle sessile or nearly so within the last leaf, large and loose, with very numerous much divided capillary branches, scattered along the main rhachis and very rarely clustered. Spikelets all pedicellate, about 1 line long, acute, glabrous, often dark-coloured. Outer glume ovate, acute, 1 or sometimes 3-nerved, nearly $\frac{1}{2}$ the length of the spikelet; 2nd and 3rd glumes nearly equal, acute, rather broad, membranous with usually 5 not prominent nerves, the 3rd quite empty without any palea. Fruiting glume smooth and shining.—*Turn. Ag. Gaz. N.S.W.* iii.

Hab.: Brisbane River, Moreton Bay, *F. v. Mueller, Bailey*.

45. ***P. *miliaceum*** (Millet-like), *Linn.; Spec. Pl.* 58. The "Little Millet." An annual from 2 to 4ft. high. Stems stout, leafy and branching. Leaves linear, acute, 6 to 12in. long, glabrous or hairy, margins scabrous, the sheaths loose and deeply grooved, with reflexed hairs, the ligula of long hairs. Panicle nodding. Spikelets pedicellate, ovoid, about 2 lines long, outer glume acute, 3-nerved, above half as long as the broad membranous 7 to 11-nerved 2nd and 3rd glumes. Fruiting glume smooth and shining.

Hab.: This grass is cultivated in most hot countries and the specimens which have been sent to me from time to time may have been strays from cultivation.

46. ***P. Prenticeanum*** (after Dr. Chas. Prentice), *Bail. 3rd. Suppl. Sy. Q. Fl.* A tall branching grass often attaining over 10ft. in height. Stems slender, hard, seldom exceeding $\frac{1}{2}$ in. diameter, often rooting from the lower nodes; upper nodes with a ring of short silky hairs. Leaves 6 to 10in. long, $\frac{1}{2}$ in. broad, tapering into long narrow points; midrib prominent, slightly pubescent; sheaths very loose and pubescent, much shorter than the lamina; ligula ciliate. Panicle about 6in. long; rhachis pubescent, pedunculate above the last leaves, much branched, the branch slender erecto-patent, the lower ones often clustered. Spikelets pedicellate, about 1 line long, slightly pubescent. Outer glume scarcely acute, $\frac{1}{2}$ or $\frac{3}{4}$ the length of the others, 3-nerved; 2nd and 3rd glumes nearly equal.

and more or less distinctly 5-nerved; fruiting glume hard and glossy, sometimes showing 1 or 3 keels. Styles shortly united. Stigmas densely plumose, of a purple colour.

Hab.: Harvey's Creek, Russell River and Tringilburra Creek. Very abundant on the rich scrub lands, attaining frequently the height of 15 or more feet. The same grass is met with in New Guinea, as would appear from fragments I received from the late Mr. C. H. Hartmann. Although a true *Panicum*, this fine species much resembles an *Isachne*.

47. ***P. effusum*** (panicle spread out), *R. Br. Prod.* 191; *Benth. Fl. Austr.* vii. 488. An erect perennial, sometimes short and under 1ft. but attaining the height of 2 or 3ft. Leaves lanceolate or linear-lanceolate, scabrous and hairy as well as the sheaths, the nodes bearded with long spreading hairs; ligula very short and ciliate. Panicle much-branched, sessile within the last leaf, 3 to 4in. long when first in flower, at length twice as long, the filiform divided branches very spreading and flexuose, the lower ones densely clustered but not verticillate, the upper ones scattered and distant. Spikelets all pedicellate, acute, about 1 line long, glabrous. Outer glume acute, 1 to 3-nerved, about $\frac{1}{2}$ the length of the spikelet or rather more; 2nd and 3rd glumes nearly equal, 5 or 7-nerved, a palea within the 3rd about $\frac{1}{2}$ its length. Fruiting glume smooth and shining.—*Sieb. Agrostoth.* n. 67; *Trin. Spec. Gram.* t. 244; *Turn. Ag. Gaz.* N.S.W. iii.

Hab.: Rockhampton, and many other northern localities to Cape York, *Daemel*; and also common in southern localities.

48. ***P. Mitchelli*** (after Sir T. Mitchell), *Benth. Fl. Austr.* vii. 489. An erect grass, decumbent at the base only, 2 to 3ft. high, nearly allied to *P. effusum*, but larger, quite glabrous and the nodes not bearded. Leaves often long, the short ligula rather jagged than ciliate. Panicle usually very large and spreading with very numerous divided filiform branches, the lower ones clustered and rigid, the upper ones scattered. Spikelets all pedicellate, usually several along the ultimate branches, rather above 1 line long, acutely acuminate, quite glabrous. Outer glume acute, nearly $\frac{1}{2}$ the length of the spikelet, 1 to 3-nerved; 2nd and 3rd glumes nearly equal, acutely acuminate, about 5-nerved, a palea in the 3rd, sometimes very small, more frequently above $\frac{1}{2}$ the glume. Fruiting glume smooth and shining.

Hab.: North-east coast, *A. Cunningham*; Cape York, *Daemel*; Port Curtis, *M'Gillivray*; Rockingham Bay, *Dallachy*; Rockhampton, *O'Shanesy*; Warwick, *Beckler*.

A small glaucous plant with a smaller panicle and rather larger spikelets, from Cooper's Creek, *Howitt's Expedition*, appears to be a variety of this species.—*Benth.*

49. ***P. decompositum*** (much divided), *R. Br. Prod.* 191; *Benth. Fl. Austr.* vii. 489. Barley Grass. "Tindil," Cloncurry, *Palmer*. A common glabrous grass, spreading, and 2 to 3ft. high. Leaves mostly long, flat and rather broad especially when growing in water, narrow in drier situations; ligula very short and broad, ciliate. Panicle 6in. to 1ft. long or even more, with numerous crowded filiform divided branches, the lower ones clustered, at first erect and enclosed at the base within the last leaf-sheath, at length sometimes very loose and spreading to the breadth of 1ft. Spikelets all on slender pedicels, narrow, acute, $1\frac{1}{2}$ to $1\frac{1}{4}$ line long, usually of a pale straw colour. Outer glume very short, broad and truncate, thin and nerveless; 2nd and 3rd glumes nearly equal, acute, thinly membranous, 5 or 7-nerved, the 3rd with a palea of $\frac{1}{2}$ to $\frac{3}{4}$ its length but no stamens. Fruiting glume very smooth and shining.—*Turn. Ag. Gaz.* N.S.W. iii.; *P. amabile*, Balansa in *Bull. Soc. Bot. Fr.* xix. 924, at least as to the W. Australian plant referred to; *P. lavinode*, Lindl. in *Mitch. Three Exped.* i. 238.

Hab.: Gulf of Carpentaria, *R. Brown*; Port Curtis, *M'Gillivray*; Brisbane River, *Bailey*; Flinders River, *Sutherland*; King's Creek, *Bowman*; Peak Downs, *Burkitt*; also in *Leichhardt's* collection; Russell and Johnson Rivers, *Hill*.

Seed ground and made into bread.—*Palmer*.

50. **P. proliferum** (proliferous), *Lam. in Encycl.* iv. 747; *Hook. in Fl. Brit. Ind.* vii. 50. Stems erect, 2 to 5ft. high, stout of a somewhat succulent consistence; the lower nodes somewhat enlarged. Leaves ensiform, 6 to 12in. long, 3 to 8 lines broad, sheaths loose; ligula of fine hairs. Panicle 6 to 12in. long, the branches rather distant, scaberulous. Size of spikelets various, terete, palea of 3rd glume wanting or minute or linear, neuter or male or rarely hermaphrodite. 2nd glume ovate, acuminate, 9-nerved; 3rd 9-nerved, 4th oblong acuminate smooth.—Vasey Ag. Gr. U.S.

Hab.: At one time this species was plentiful in the still waters about Brisbane. Included with *P. decompositum* in *Fl. Austr.* but of very different habit, the one being a water plant and the other a most common downs species.

51. **P. trachyrhachis** (rhachis rough), *Benth. Fl. Austr.* vii. 490. Coolibar Grass. "Oo-kin," Mitchell River, *Palmer*. A tall erect stout glabrous plant, nearly allied to *P. decompositum*. Leaves long and narrow, the ligula reduced to a ring of cilia, the nodes glabrous. Panicle large and loose, often 1 to 1½ft. long, with numerous long slender divided branches, the lower ones usually verticillate, scabrous as well as the rhachis. Spikelets all pedicellate, nearly 1½ line long. Outer glume often as long as the others, 8 or 5-nerved, tapering into a long point, sometimes ciliate at the end; 2nd and 3rd glumes nearly equal, acutely acuminate, 7 or 9-nerved, the 3rd with a palea often nearly as long. Fruiting glume much shorter, obtuse, smooth and shining.—Maid. Gr. N.S.W. 50.

Hab.: Percy Islands, *A. Cunningham*; Brisbane River, *Bailey*; Peak Downs, *F. v. Mueller*; Springsure, *Wuth.*

Fibre from the under surface of leaf twisted and used for making twine.—*Palmer*.

Var. tenuior. More slender, panicle not so large and less scabrous, and the glumes less acute.

52. **P. prolutum** (from growing in wet places), *F. v. M. in Trans. Vict. Inst.* 1855, 46; *Benth. Fl. Austr.* vii. 490. Stems from a branching base, erect, rigid, 1 to 2ft. high. Leaves rather rigid, the margins involute when dry, glabrous and glaucous; ligula very prominent, scarious, truncate or slightly jagged. Panicle 8 to 6in. long, of numerous slender divided branches, the lower ones clustered, erect and enclosed at the base by the last sheath or at length exerted and spreading. Spikelets on filiform pedicels ovoid, acute, glabrous, about 1½ line long. Empty glumes rather rigid, prominently nerved, the outer one obtuse, with scarious margins, more than ¼ the length of the spikelet, 8 or 5-nerved, the 2nd and 3rd nearly equal, acute, 5 or 7-nerved, no palea in the 3rd. Fruiting glume smooth and shining.—Turn. Ag. Gaz. N.S.W. ii.

Hab.: Condamine River, *Hartmann*; Armidilla, *Barton*.

The species is readily distinguished from all others of the group by the much longer not-ciliate ligula.

5. ICHNANTHUS, Sw.

(Probably from *ichnos*, a vestige; and *anthos*, a flower.)

Spikelets 1 to 2-flowered, pedicels long, ovate or lanceolate, terete, articulate (but often persistent), on their pedicels. Glumes 4, 1st, 2nd and 3rd subequal or 2nd the longest, strongly nerved; 3rd paleate or not, male or neuter; 4th much the shortest, stipitate, paleate, bisexual, oblong or oblong-lanceolate, stipes with an anticous simple or 2-fid or 2 lateral appendages. Lodicules 2, minute. Styles free, exerted apically. Stamens 3. Grain coriaceous, acute or acuminate, polished, articulate at the base of the stipes.

Species all tropical.

This genus differs from *Panicum* in the appendaged base of the 4th glume.

1. **I. pallens** (pale), *Munro, in Benth. Fl. Hongk.* 414; *Hook. in Fl. Brit. Ind.* vii. 60. Stems 1 to 2ft. long, weak decumbent; loosely branched, and more or less pubescent. Leaves about 3in. long, and ¾in. broad, broadly-lanceolate,

thin, flat, cordate-acuminate, scabrous; base rounded or cordate, ciliate; sheath loose; ligula more or less ciliate. Panicle narrow, unilateral; about 6 in. long; branches erect or spreading, few and slightly divided, and pedicels scaberulous. Spikelets narrow, 2 or 3 lines long, green; 1st and 3rd glumes persistent, keels scabred; 1st more than $\frac{1}{2}$ the length of the 3rd, ovate-lanceolate, subaristate, 3-nerved, 2nd acuminate, 5-nerved; 3rd obtuse, 5-nerved, palea large; 4th = $\frac{1}{2}$ 3rd, deciduous, smooth, pale, turned half round so that the long diameter is at right angles to the plane of the spikelets; appendages obscure. Hook. l.c. remarks that the oblique position of the grain is very peculiar.—*Panicum vicinum*, Bail. 3rd. Suppl. Syn. Ql. Fl. 82.

Hab.: Harvey's Creek, Russell River, on rich land.

6. CHAMÆRAPHIS, R. Br.

(Ground-needles, referring to the awn-like point of the partial rhachis.)

Spikelets with 1 terminal flower usually female by abortion and a male one below it, few and distant or solitary on the filiform branches of a simple panicle, the partial rhachis produced into a long awn-like point beyond the insertion of the upper or only spikelet. Glumes 4, the outer empty one very small, the 2nd and 3rd nearly equal, membranous or at length rigid, many-nerved, often tapering to a point but not awned, the 3rd with a palea and 3 stamens in its axil, the 4th or fruiting glume shorter and very faintly nerved. Palea with inflected margins but not auriculate. Staminodia usually 2, very slender, with small abortive anthers. Styles very shortly united at the base. Grain enclosed in the scarious or rather rigid fruiting glume and palea, but free from them.—Semi-aquatic grasses, glabrous or nearly so. Leaves flat, the ligula short.

The genus extends over tropical Asia.

Panicle spreading, with distant spikelets on filiform branches. Fruiting glume short and obtuse

Panicle spike-like but loose, the spikelets often 2 together on the lower branches. Fruiting glume acute. Outer glume $\frac{1}{2}$ line long, membranous. 1. *C. spinescens*.

2. *C. paradoxa*.

1. ***C. spinescens*** (spiny-looking), Poir. Dict. Suppl. ii. 189; Benth. Fl. Austr. vii. 498. Stems creeping at the base and when in water forming large floating masses. Leaves linear-lanceolate, flat, with loose flattened sheaths, quite smooth or slightly scabrous. Panicle 2 to 4 in. long, with rather numerous filiform flexuose spreading branches produced beyond the last spikelet into an awnlike point always longer than the spikelet. Spikelets few on each branch, shortly pedicellate but closely appressed in each bend of the rhachis, the pedicels and rhachis usually minutely scabrous-ciliate, the spikelet very narrow, about 3 lines long in the typical form. Outer glume about $\frac{1}{2}$ line long, thinly membranous the 2nd many-nerved, tapering to a long point, the 3rd usually rather smaller with a shorter point and fewer nerves, enclosing the male flower, the fruiting glume much shorter, obtuse, very thin, and remaining thin as well as the palea over the grain, which readily falls out of them.—*C. aspera*, Nees in Wall. Cat. Herb. Ind. n. 8679; *Panicum spinescens*, R. Br. Prod. 193.

Hab.: Moreton Bay, F. v. Mueller; East Australian lagoons, Leichhardt.

Var. *parvispicula*, differing only in the much smaller spikelets.—*Panicum abortivum*, R. Br. Prod. 193; *Chamæraphis abortiva*, Poir. Dict. Suppl. ii. 189.

Hab.: Islands of the Gulf of Carpentaria, R. Brown; between the Norman and Gilbert Rivers, Gulliver; Rockingham Bay, Dallachy.

The species is generally spread over East India from Ceylon and the Peninsula to the Malayan Archipelago and South China.

2. ***C. paradoxa*** (paradoxical), Poir. Dict. Suppl. ii. 189; Benth. Fl. Austr. vii. 499. A smaller plant than *C. spinescens*. Leaves mostly short and spreading. Panicle almost reduced to a simple spike-like raceme, the awnlike branches mostly

bearing only a single spikelet near the base, the lower ones only occasionally more elongated with 2 distant spikelets, the rhachis always produced into a long awn exceeding the spikelet. Spikelets acuminate, 4 to 5 lines long. Outer glume broad, thinly membranous, about $\frac{1}{2}$ line long, the 2nd and 3rd glumes nearly equal, striate with many nerves; fruiting glume oblong, acute, nearly 2 lines long, thin and almost nerveless.—Maid. Gr. N.S.W. 59; *Panicum paradoxum*, R. Br. Prod. 193; Kunth, Rev. Gram. t. 32; Gaudich. in Freyc. Voy. Bot. t. 21.

Hab.: Recorded for Queensland by F. v. M.

7. SPINIFEX, Linn.

(Referring to the spine-like leaves.)

Spikelets diœcious, spicate or solitary on partial rhachises collected in dense globular heads with a bract under each rhachis. Male plant: Spikelets usually several to each bract, spicate or clustered, 2-flowered. Glumes 4, nearly similar, 2 outer empty ones sometimes smaller sometimes larger than the 2 flowering ones. A perfect palea and 3 stamens within each flowering one. Fertile plant: Spikelets solitary within each bract at the base of a partial rhachis, with 1 female or hermaphrodite flower and an imperfect or rudimentary or sometimes a male flower below it. Glumes 4 as in the males, the 3rd with a more or less developed palea and sometimes 3 stamens or staminodes. Palea in the 4th glume perfect. Stamens 3, often imperfect. Styles 2, distinct, with long shortly plumose stigmas. Grain enclosed in the hardened glume and palea and free from them.—Spreading or creeping hard branching grasses, the flowering branches subtended by leafy or lanceolate and concave bracts.

The genus extends to the coasts of New Zealand, New Caledonia and the sandy sea-shores of tropical Asia.

Heads of spikelets several inches diameter. Male spikelets in spikes of 1 to 1½ in. Females at the base of rigid rhachises of 3 to 4 in.

Plant silky-pubescent or villous

1. *S. hirsutus*.

Plant glabrous

2. *S. longifolius*.

Heads of spikelets not above 1 in. diameter. Male spikelets solitary or clustered within small bracts. Females within broad bracts, the rhachis shorter than the spikelet and sometimes minute or obsolete

3. *S. paradoxus*.

1. *S. hirsutus* (hairy). Labill. Pl. Nor. Holl. ii. 81, t. 280, 281; Benth. Fl. Austr. vii. 503. Stem stout, creeping in the sand, forming large tufts. Leaves often above 1 ft. long with involute margins, clothed as well as the whole plant with silky or woolly hairs. Male plant: Spikes sessile or pedunculate, few or many in a terminal head or umbel and often a cluster of 2 or 3 spikes or a single spike lower down on the stem, each spike 1 to 1½ in. long, the rhachis produced into a point usually exceeding the spikelets and sometimes very long. Bracts under the spikes or peduncles lanceolate, acuminate, concave. Spikelets sessile in the spike or scarcely pedicellate, 5 to 6 lines long. Glumes membranous, hairy, the empty ones 5 or 7-nerved, usually as long as or longer than the flowering ones. Fertile plant: Spikelets very numerous in a large dense globular head, each one solitary at the base of a spine-like rhachis of 4 in, or more, subtended by a much shorter linear-lanceolate bract, the spikelet 6 to 7 lines long, acute or acuminate. Glumes all nearly similar, with 7 or more nerves, the 2 outer ones rather the largest with more nerves than the others. A palea and sometimes 3 stamens in the axil of the 3rd, and an ovary and 3 stamens or staminodes in the terminal one.—Sieb. Agrostoth. n. 62; Hook. f. Fl. Tasm. ii. 106; F. v. M. Fragm. viii. 138; Maid. Gr. N.S.W. 60; Buch. Ind. Gr. N.Z. vii. and ix.; *S. sericeus*, R. Br. Prod. 198.

Hab.: Abundant on the coast sands. Also in New Zealand and New Caledonia.

2. **S. longifolius** (leaves long), *R. Br. Prod.* 198; *Benth. Fl. Austr.* vii. 504. Closely resembles *C. hirsutus* but quite glabrous except the long cilia of the ligula and sometimes a few on the margins of the leaf-sheaths. Leaves narrow, rigid, often above 1ft. long but not so pungent as in the Asiatic *S. squarrosus*, of which *S. longifolius* may perhaps be a variety only. Male spikes usually looser than in *S. hirsutus*. Spikelets scarcely 5 lines long, the outer empty glumes shorter than the flowering ones. In the female spikes the outer glumes quite as long as the inner ones, and seldom if ever palea or stamens in the 3rd glume.—*Nees in Pl. Preiss.* ii. 95; *F. v. M. Fragm.* viii. 139; *S. fragilis*, *R. Br. l.c.*

Hab.: Islands of the Gulf of Carpentaria, *R. Brown.*

3. **S. paradoxus** (paradoxical), *Benth. in Hook. l.c. Fl. t.* 1243, 1244; *Benth. Fl. Austr.* vii. 504. Glabrous, divaricately branched, rigid and brittle but not so stout as the preceding species, the branches in clusters of 3 to 6 surrounded by short leaves with loose sheaths, the lower stem-leaves long and narrow; the ligula a dense ring of cilia. Male plant: Spikelets in a dense cluster or head of $\frac{1}{2}$ to $\frac{3}{4}$ in. diameter, 1 to 3 outer bracts lanceolate and about as long as the head, the inner ones much reduced, the spikelets about 8 lines long, the outer ones nearly sessile, the inner ones pedicellate and sometimes 2 on a pedicel, the pedicel or axis produced into a point shorter than the spikelet. Outer empty glumes 2, several-nerved; flowering glumes 2, nearly equal, longer than the empty ones, each with a palea and 3 stamens. Female plant: Heads the size of the males when in flower, but the bracts larger and broader, and when in fruit the bracts variously enlarged, 1 or 2 often becoming curved, lin. long or more, broad with hard centres and scarious margins, sometimes all scarcely changed. Spikelets almost sessile within each bract, the very short pedicel produced into a point much shorter than the spikelet, and sometimes minute or obsolete. Empty glumes prominently 7 or 9-nerved, the 2 outer rather shorter than the 3rd, which is either empty like them or contains a small palea. Fruiting glume shorter, very acute, smooth and shining. Styles distinct.—*Neurackne paradoxa*, *R. Br. in App. Sturt Exped.* 26; *Panicum pseudoneurackne*, *F. v. M. Fragm.* viii. 199.

Hab.: An inland species.

8. AXONOPUS, Beauv.

(From *axon*, axis, and *pous*, a foot.)

Perennial grasses. Spikelets 2-flowered, articulate with the pedicel, sessile or subsessile in whorls or digitate spikes, awned. Glumes 4, 1st shortest, ovate, acuminate or cuspidate, glabrous, 3-nerved; 2nd ovate-lanceolate, acuminate or awned, 5-nerved, lateral nerves marginal villous; 3rd oblong, acute, 5-nerved, paleate, male, palea very short, 2-fid or 2-partite; 4th=2nd, oblong or ovate, coriaceous, 2-nerved. Lodicules cuneate. Stamens 3, anthers long. Styles distinct. Grain small, suborbicular, free within the glumes.

1. **A. semialatus** (half-winged), *Hook. Fl. Brit. Ind.* vii. 64. Cockatoo Grass. Stems erect, 2 to 3ft. high, silky-pubescent about the nodes, otherwise glabrous or nearly so. Leaves narrow with involute margins or subulate, usually pubescent, the lower ones sometimes densely clothed with long silky hairs. Panicle 3 to 6in. long, consisting of 2 to 5 long erect or slightly diverging branches, clustered at the end of a long peduncle. Spikelets 2 to 2½ lines long, few together in erect clusters or short branches along the rhachis. Glumes all ending in a short subulate point, the outer one membranous, 3-nerved, about $\frac{1}{2}$ the length of the spikelet, the 2nd the largest, membranous, 5-nerved, fringed on each side with long pale or dark-coloured hairs spreading in fruit and connected

at the base on the intramarginal nerve; 8rd glume more rigid, though thin, with a small palea and sometimes with 8 stamens in the axil. Fruiting glume more rigid, with a rather longer point, the palea also rigid, but the inflexed margins thin with a distinct lobe at the base on each side.—*Panicum semialatum*, R. Br. in Fl. Austr. vii. 472; Maiden Gr. N.S.W.; *Urochloa semialata*, Kunth, Enum. i. 74; *Coridochloa semialata*, Nees, in various catalogues, Benth.

Hab.: Throughout Queensland.

Dr. Lumholtz found this grass, in North Queensland, to furnish the principal food of white cockatoos. An excellent pasture grass, producing a large amount of leafy bottom, although the hard cane-like stems are refused by stock.

9. *TRICHOŁÆNA, Schrad.

(Clothed with hairs)

Erect tufted annual or perennial grasses. Leaves narrow. Spikelets 1 to 2-flowered, articulate on their pedicels, paniculate, laterally compressed, clothed with long silky hairs, callus stipite-form. Glumes 3 or 4, 1st if present very small, often inserted much below the 8rd; 2nd and 8rd sub-equal, membranous, broadly ovate, mucronate or awned, dorsally rounded; 8rd paleate, triandrous; 4th very thin, shining, female or bisexual. Lodicules 2, minute, dolabriform. Grain loose within the glumes.

Species chiefly South African.

1. **T. Teneriffæ** (of Teneriffe), *Parlat. in Webb and Berth. Phyt. Canar.* iii. 425; *Fl. Bal.* i. 180; *Hook. Fl. Brit. Ind.* vii. 65. Stems numerous from an extending rhizome, geniculate slender and rigid. Leaves very slender, convolute, rigid, glabrous, sheath hairy at the orifice; ligula narrow and membranous. Panicle 4 to 5in. long, open, the branches and pedicels capillary. Spikelets about 2 lines long, purplish, silky with spreading hairs; 2nd and 8rd glumes ovate acute or mucronate, concave; 4th articulate at the base, white or brown, shining.—*Panicum Teneriffæ*, R. Br. Prod. 189.

Hab.: A North African species naturalised in many southern localities. Known in Queensland under the name of Red Natal Grass, grows fast nearly throughout the year, but is not considered to stand close feeding.

10. OPLISMENUS, Beauv.

(Awned.)

(*Orthopogon*, R. Br.)

Spikelets with 1 terminal hermaphrodite flower and a rudimentary one below it, awned, clustered along the second distant branches of a simple panicle. Glumes 4, the lowest empty one not much shorter than the others and with a longer awn, the flowering glume awnless and hardened with the palea round the grain as in *Panicum*.

A small tropical and subtropical genus common to the New and the Old World, and very closely allied to some of the awned species of *Panicum*, to which several botanists would restore it. The inflorescence, together with the greater development and long awn of the outer empty glume, may however suffice to retain it as distinct, with the limits originally assigned to it by Beauvois and by Brown. The Australian species are both of them of a very wide distribution.—*Benth.*

Lower branches of the panicle $\frac{1}{2}$ to 2in. long 1. *O. compositus*.
All the branches of the panicle reduced to sessile clusters 2. *O. setarius*.

1. **O. compositus** (composite), *Beauv. Agrostogr.* 54; *Benth. Fl. Austr.* vii. 491. Usually a weak grass softly pubescent or villous, but sometimes nearly glabrous. Stems decumbent or creeping and rooting at the base, ascending sometimes to above 1ft. Leaves from linear-lanceolate to ovate-lanceolate, 4 to 5in. long in the larger specimens, but more frequently under 2in. Panicle slender consisting

of 4 to 8 or rarely more distant 1-sided branches or spikes, of which the lowest slender ones are 2 in. long in the most luxuriant specimens, scarcely $\frac{1}{2}$ in. long in others, the upper ones or sometimes the greater number reduced to short clusters. Spikelets glabrous pubescent or hirsute, rather above 1 line long, in distinct clusters of 2 or 8 each along the longer branches, crowded on the shorter ones. Glumes 8, lower ones membranous, 5-nerved, the lowest not much shorter than the others tapering into a rather long smooth awn, the 2nd with a small point or short awn, or only acuminate, the 3rd rather larger, awnless, with a small hyaline palea or rudimentary flower in its axil; flowering glume nerveless, smooth and hard as well as the palea round the grain.—Turn. Ag. Gaz. N.S.W. ii. Pl. xli.; *Panicum compositum*, Linn.; Trin. Spec. Gram. ii. t. 187, 188, 190; F. v. M. Fragm. viii. 199; *Orthopogon compositus*, R. Br. Prod. 194.

Hab.: Shoalwater Bay and Broadsound, R. Brown; Cape York, Daemel; Endeavour River, A. Cunningham; Goold and Dunk Islands, M. Gillivray; Rockingham Bay, Dallachy.

2. *O. setarius* (Setaria-like), Rom. and Schult.; Kunth, Enum. i. 139; Benth. Fl. Austr. vii. 492. Very near the slender forms of *O. compositus*, and might be included in that species, but the spikes or branches of the panicle are all reduced to single sessile clusters of spikelets, or the lowest rarely slightly elongated into 2 distinct clusters. Leaves always narrow-lanceolate.—*Panicum setarium*, Lam. Illust. i. 170.

Hab.: Keppel Bay, R. Brown; Moreton Bay, C. Stuart.

Var. *amulus*. Softly villous. This is the *Orthopogon amulus*, R. Br. Prod. 194 (*Oplismenus amulus*, Kunth, Enum. i. 142).

Var. *imbecillis*. Glabrous or nearly so. This is the *Orthopogon flaccidus* and *O. imbecillis*, R. Br. Prod. 194 (*Oplismenus flaccidus* and *O. imbecillis*, Kunth, Enum. i. 142; *Panicum imbecille*, Trin. Spec. Gram. t. 191).

11. ARUNDINELLA, Raddi.

(From its reedy appearance.)

Spikelets with 1 terminal hermaphrodite flower and often a second male one below it, in a loose terminal panicle. Glumes 4, the 8 outer ones often pointed but not awned, the 3rd with a palea or a male flower in its axil; terminal flowering glume smaller, thinner, with a fine awn twisted in the lower part and bent back at or below the middle. Palea smaller. Styles distinct. Grain enclosed in the more or less stiffened glume and palea, free from them.

A tropical or subtropical genus, chiefly Asiatic.

1. *A. nepalensis* (of Nepal), Trin. Spec. Gram. t. 268; Benth. Fl. Austr. vii. 545. An erect glabrous perennial, attaining 6 to 8 ft. Leaves narrow, the ligula short, minutely ciliate. Panicle narrow, dense or loose, erect or slightly spreading, varying from 4 to 6 in. in the smaller specimens to above 1 ft. in luxuriant ones, the lower branches densely clustered. Spikelets all or mostly pedicellate, narrow, about 2 lines long, the 3 outer glumes usually 5-nerved, tapering to short points, the lowest rather shorter than the others, the 3rd rather thinner, with a male flower in its axil. Terminal flowering glume smaller and thinner at the time of flowering, slightly notched with minute obtuse or acute points on each side of the awn not produced into bristles. Palea auriculate on each side near the base.—*A. brasiliensis*, Raddi. Agrost. Bras. 37, t. i. fig. 3; Hook. in Fl. Brit. Ind. vii. 73; *Acratherum miliaceum*, Link, Hort. Bot. Berol. i. 280.

Hab.: Brisbane River, Moreton Bay, Bailey; Dry-beef Creek, Leichhardt; Rockhampton and neighbourhood, Thozet, O'Shanesy; Darling Downs, Law.; Springsure, Wuth.; Herbert's Creek, Bowman; Rockingham Bay, Dallachy. A common coarse hillside grass.

Widely distributed over the hilly districts of tropical Asia, extending to South Africa.

12. SETARIA, Beauv.

(Referring to the bristly panicle.)

Spikelets with 1 terminal hermaphrodite flower and sometimes a second male one below it, crowded in a cylindrical dense or rarely interrupted spikelike panicle, not awned but surrounded by numerous awnlike barren branches, persistent on the main rhachis, the spikelets sessile near the base of the branches and falling away from them. Glumes 4, the outer one small, the 2nd usually shorter than the 3rd. A palea and sometimes 3 stamens in the axil of the 3rd. Terminal or fruiting glume of a firmer consistence, with a perfect flower. Styles distinct. Grain enclosed in the hardened glume and palea, but free from them.

The genus is generally spread over the warmer and temperate regions of the globe.

- Panicle dense, inclined or nodding, compound; the 1st glume subglobose nearly smooth 1. *S. italica*.
 Fruiting glume transversely rugose. Awnlike panicle-branches scabrous, with erect teeth.
 Panicle cylindrical, simple, 1 to 1½ in. long, the spikelets solitary at the base of the awn-like branches 2. *S. glauca*.
 Panicle dense or interrupted, 3 to 8 in. long, the spikelets clustered near the base of the awn-like branches 3. *S. macrostachya*.
 Fruiting glume smooth. Spikelets more or less clustered.
 Awn-like panicle-branches scabrous with erect teeth 4. *S. viridis*.

1. *S. italica* (Italian), Beauv. *Agrost.* 51. Annual. Stems 2 to 5 ft. usually branched, tufted, rooting towards the base. Leaves often long, margins retrorsely hispid, the sheath smooth, bearded at the mouth. Panicle often large and very dense, lobed, with minute spreading barbs, the bristles not numerous, 1st glume oblong or subglobose, nearly smooth.

Hab.: Has escaped from cultivation. Grown as a fodder in most countries, known in Queensland as *Panicum*. Supposed to belong to China and Japan.

2. *S. glauca* (grey), Beauv.; Kunth, *Enum.* i. 149; Benth. *Fl. Austr.* vii. 492. An erect annual, of a pale-green, 1 to 2 ft. high. Leaves flat, with scabrous edges and often ciliate with a few long hairs. Spikelike panicle simple, cylindrical, 1 to 1½ in. long, the spikelets solitary at the base of numerous awnlike branches, many of which are barren and all scabrous with minute teeth directed upwards. Spikelets ovoid, about 1½ line long. Outer glume very small, the 2nd not quite so long as the 3rd. A palea and very rarely stamens in the 3rd. Fruiting glume more or less gibbous, marked with prominent transverse wrinkles. —Reichb. Ic. Fl. Germ. t. 47; Turn. Ag. Gaz. N.S.W. ii. Pl. xlii.; *Panicum glaucum*, Linn.; Trin. Spec. Gram. t. 195; *Pennisetum glaucum*, R. Br. Prod. 195; F. v. M. *Fragm.* viii. 110.

Hab.: In tropical Queensland this is represented by a form which seldom exceeds a foot in height, but in southern Queensland it forms a rich fodder grass of two to three feet, and bears an abundance of seed, even though closely fed. One or other of these forms are met with in most parts of Queensland.

A common weed in the Old World and some parts of America.

3. *S. macrostachya* (spikes long), H. B. and K. *Nov. Gen. et Sp.* i. 110; Benth. *Fl. Austr.* vii. 493. Much taller and stouter than *S. glauca*. Leaves long, flat, often above ½ in. broad, the ligula short, ciliate, otherwise quite glabrous in the typical form. Spikelike panicle 3 to 8 in. long, compound, usually very compact and cylindrical or the lower branches longer. Spikelets numerous on the lower branches, few on the upper ones, in dense clusters more or less interspersed with awnlike barren branches, ovoid, acute, fully 1½ line long, glabrous. Outer glume about ½ the length of the spikelet, the 2nd shorter than the 3rd but variable in proportion, all membranous with prominent nerves. Fruiting glume often oblique or gibbous, always marked with prominent transverse wrinkles as in

S. glauca.—Bail. Ill. Mono. Gr. Q. i.; *Panicum macrostachyum*, Nees; *Pennisetum italicum*, R. Br. Prod. 195; F. v. M. Fragm. viii. 110, but not the *Panicum italicum*, Linn.

Hab.: Endeavour River, *Banks and Solander*; Port Denison, *Fitzalan*; Herbert's Creek, *Bowman*; Rockhampton, *O'Shanesy*; Brisbane and Gilbert Rivers, *F. v. Mueller*, and other localities in south Queensland from various collectors.

This species is common in many parts of tropical America.

This grass has a much broader leaf than *S. glauca*, and more spreading panicles. Naturally it is met with in rich scrubs from whence it has been brought and sown on open lands with good results, proving itself worthy of field culture either for cutting for green fodder or for grazing. Of this species there are also two forms. The one most usually met with in the tropical parts of Queensland has purplish coloured awns, and a more interrupted inflorescence, and is of weaker habit.

4. *S. viridis* (green), *Beauv.*; *Kunth, Enum.* i. 151; *Benth. Fl. Austr.* vii. 494. An annual with the habit of the *S. glauca*, but the spikelike panicle looser, 1 to 2 in. long in the typical form, but occasionally nearly twice that, the lower spikelets in distinct clusters or on short branches, the awnlike branches more irregular and often shorter, the asperities directed upwards as in *S. glauca*. Outer glume acute, about $\frac{1}{2}$ the length of the spikelet; 2nd and 3rd glumes nearly equal, broad, concave, 5 or 7-nerved. Fruiting glumes smooth and shining, the minute transverse wrinkles visible only under a lens.—*Reichb. Ic. Fl. Germ.* t. 47; *Panicum viride*, Linn.; *Trin. Spec. Gram.* t. 203; *Pennisetum viride*, R. Br. Prod. 195.

Hab.: Manfred Downs, *Mrs. J. H. Moore*.

Widely spread as a weed in many parts of the Old World, but not so common as *S. glauca*.

13. PENNISETUM, Rich.

(Referring to the bristles being feathery.)

(*Gymnothrix*, *Beauv.*).

Spikelets 1-flowered, solitary or 2 or 3 together, sessile or nearly so, each one enclosed in an involucre of several usually numerous simple or plumose bristles (probably awnlike branches of the panicle), the involucres crowded in a spike or spikelike simple panicle, falling off from the main rhachis with the spikelet and short peduncle. Glumes 4, the outer one shorter or sometimes minute, the 2nd and 3rd both empty. Fruiting glume usually smaller. Palea perfect. Styles distinct or united almost to the plumose stigmas. Nut enclosed in the more or less hardened glume and palea, free from it.

The genus is spread over the tropical regions of the Old World with a few American species.

Involucral bristles numerous, all simple, surrounding the spikelet in several rows

1. *P. compressum*.

Involucral bristles 6 to 10, all plumose at the base, closely surrounding the spikelet

2. *P. arnhemicum*.

1. *P. compressum* (flattened), *R. Br. Prod.* 195; *Benth. Fl. Austr.* vii. 495. Swamp Fox-tail grass. Stems 2 to 8 ft. high, erect, usually very scabrous and more or less hirsute under the panicle, glabrous and smooth lower down. Leaves long and narrow, glabrous, the ligula prominent. Involucres nearly sessile in a simple cylindrical dense spike of 3 to 6 in., consisting of numerous very unequal bristles, the inner more rigid ones varying from $\frac{1}{4}$ to 1 in., the outer ones much shorter and finer, mostly minutely scabrous-ciliate but none of them plumose. Spikelets solitary within the involucre, narrow, terete, rather acute, about 3 lines long. Outer glume under $\frac{1}{2}$ line long, orbicular, 2nd glume from $\frac{1}{3}$ to $\frac{1}{2}$ the length of the spikelet, the 3rd many-nerved, empty. Fruiting glume scarcely more rigid than the 3rd. Styles united up to

the feathery branches.—F. v. M. *Fragm.* viii. 110; Turn. *Ag. Gaz.* N.S.W. ii. Pl. xxxv; *Setaria compressa*, Kunth, *Enum.* i. 150; *Gymnothrix compressa*, Brongn. in Duperr. *Voy. Bot.* 108, t. 9.

Hab.: Brisbane River, Moreton Bay, F. v. Mueller, Leichhardt and others; Rockhampton and neighbourhood district, Thozet and others; and many other localities.

2. **P. arnhemicum** (from Arnhem's Land), F. v. M. *Fragm.* viii. 109; *Benth. Fl. Austr.* vii. 496. Stems erect, leaves narrow, rather rigid, glabrous and glaucous, the ligula very short, split into cilia. Spike rather dense, about 4 in. long, appearing woolly from the plumose bristles. Involucres almost sessile, of 6 to 10 unequal bristles, the longest about $\frac{1}{2}$ in. long, all very densely woolly-plumose with long soft white hairs. Spikelet solitary, shortly pedicellate within the involucre, about 2 lines long, quite concealed in the wool. Outer glume about $\frac{1}{2}$ the length of the spikelet, 2nd and 3rd glumes nearly equal, both empty and about 7-nerved. Fruiting glume shorter, hard, smooth and shining. Styles separate to the base or nearly so.

Hab.: Some few tropical localities.

14. PLAGIOSETUM, Benth.

(Alluding to the one-sided bristles like branchlets.)

Spikelets 1-flowered, usually solitary between the barren branches of partial panicles or involucre, not awned, the involucre few and distant along the rhachis of a simple panicle and falling off with the spikelets, the branches few with unilateral bristle-like branchlets, rarely bearing a second spikelet. Glumes 4, the outer one short, the 2nd and 3rd empty. Styles distinct. Nut enclosed in the hardened fruiting glume and palea.

The genus is limited to a single species, endemic in Australia.

1. **P. refractum** (broken), *Benth. in Hook. Ic. Pl.* t. 1242; *Benth. Fl. Austr.* vii. 494. Apparently annual, much branched, 6 in. to 1 ft. high, glabrous, leafy in the lower part, the leaves narrow. Involucres few, distant along a simple terminal leafless rhachis, all pedunculate, the peduncles spreading or reflexed, 3 to 5 lines long, articulate at the base and falling off with the involucre and spikelet. Involucre not completely surrounding the spikelet, about $\frac{1}{2}$ in. long, the bristles not plumose, united at the base into 3 or 4 slightly flattened branches with the minor branches or bristles along their inner face, the main branch continuing the peduncle. Spikelet usually solitary on a short thick pedicel between the branches, narrow, somewhat acuminate, about 3 lines long. Outer glume $\frac{1}{2}$ the length of the spikelet or rather more; 2nd and 3rd glumes both empty, equal and many-nerved. Fruiting-glume hard, apparently smooth and shining but minutely rugose under a lens.—*Setaria refracta*, F. v. M. *Fragm.* iii. 147; *Pennisetum refractum*, F. v. M. *Fragm.* viii. 109.

Hab.: A few inland tropical situations.

Occasionally but rarely the principal branch of the involucre is rather more flattened and ends in a second spikelet, but the articulation is below the involucre as in *Pennisetum*, not under each spikelet as in *Setaria*.—Benth.

15. CENCHRUS, Linn.

(From the Eastern name of the Millet.)

Spikelets with 1 terminal hermaphrodite flower and sometimes a male one below it, not awned, singly or 2 or 3 together within an ovoid or globular involucre of numerous bristles, the inner ones usually broad and flattened, connected at the base and hardened round the fruit, the involucre sessile or pedunculate in a simple spike or raceme and falling off with the spikelets. Glumes 4, the outer one much smaller, sometimes minute, the 2nd and 3rd

nearly equal or the 2nd shorter; a palea and sometimes 3 stamens in the 3rd. Fruiting glume more rigid than the others but not so much hardened as in *Panicum*. Styles usually very shortly united at the base. Nut enclosed in the fruiting glume and palea, free from them.

The genus is spread over the warmer regions of both the New and the Old World. The Australian species are endemic.

Leaves glabrous. Involucres under 4 lines long, the inner bristles or lobes plumose at the base. Spikelets solitary 1. *C. australis*.

Leaves softly villous. Involucres 5 lines long, the inner bristles or lobes shortly ciliate. Spikelets usually 3 2. *C. elymoides*.

1. ***C. australis*** (Australian), *R. Br. Prod.* 196; *Benth. Fl. Austr.* vii. 497. A stout glabrous grass, attaining 6 to 9 ft. Leaves long and flat; ligula split into cilia. Spike rather dense, 4 to 8 in. long, the rhachis slightly scabrous-pubescent. Involucres very shortly pedicellate, erect or at length reflexed, broadly ovoid, under 4 lines long, the inner bristles or lobes about 10, flattened and very shortly united at the base, plumose in the lower half, scabrous in the upper part with reversed asperities, one sometimes but not frequently longer than the others; outer bristles numerous, unequal, subulate and scabrous from the base. Spikelets solitary in the involucre and shorter than the inner lobes. Outer glume short, obtuse, hyaline, nerveless, 2nd glume acute, 3 or 5-nerved, 3rd rather longer, 5-nerved, with a palea and sometimes a male flower in its axil. Fruiting glume as long.—*Sieb. Agrostoth.* n. 53; *C. echinatus*, var. *Trin.* in *Mem. Acad. Petersb.* ser. 6, iii. 173.

Hab.: Northumberland Islands, *R. Brown*; Brisbane River, Moreton Bay, *F. v. Mueller Bailey*; Rockhampton and neighbouring districts, *Bowman*, *O'Shanesy* and others.

2. ***C. elymoides*** (Elymus-like), *F. v. M. Fragm.* viii. 107; *Benth. Fl. Austr.* vii. 498. An erect grass of several feet. Leaves flat or convolute, often very long, the sheaths and under surface villous with soft hairs. Spike 4 to 6 in. long. Involucres sessile, about 5 lines long, close together or rather distant along the flexuose rhachis. Inner bristles or lobes about 8, flat, shortly ciliate, not inflexed; outer ones shorter, rather numerous, subulate, 1 narrow inner one awnlike and at least twice as long as the others, all scabrous with asperities turned upwards. Spikelets usually 3. Outer glume very short and hyaline; 2nd glume nearly as long as the 3rd. A male flower in the 3rd glume of the central spikelet, often a palea only in the lateral spikelets. Terminal or fruiting glume enclosing a hermaphrodite or female flower, or sometimes only a male in the lateral spikelets.

Hab.: Cape York and a few other tropical localities.

16. XEROCHLOA, R. Br.

(Referring to the dry nature of the grass.)

Spikelets with 1 terminal hermaphrodite flower and frequently a male one below it, few in a short simple or branched spike almost enclosed in distant sheathing bracts along the main axis of the panicle, with a bract under each branch or spikelet. Glumes 4, thin, the outer one short, the 2nd longer, the 3rd the longest with a large very prominently 2-nerved palea and often 3 stamens. Terminal flowering glume shorter and very thin. Palea broad, closely enveloping the flower and fruit. Styles united almost up to the rather long plumose stigmas. Grain enclosed in the thin palea, free from it.

The genus is limited to Australia.

Spikelets glabrous 1. *X. imberbis*.
Pedicel 2nd glume and palea of the 3rd glume densely bearded, at least in the upper spikelets 2. *X. barbata*.

1. **X. imberbis** (glume not bearded), *R. Br. Prod.* 197; *Benth. Fl. Austr.* vii. 501. Very closely allied to *X. barbata*, with a similar habit and foliage. The flowering bracts rather narrower and more distant, more frequently terminating in a point or lamina. Spikes branched, with 5 or 6 spikelets on each branch, but the whole not much exceeding the outer bract. Glumes and palea as in *X. barbata*, except that they are all glabrous.—F. v. M. *Fragm.* viii. 117.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*.

2. **X. barbata** (bearded), *R. Br. Prod.* 197; *Benth. Fl. Austr.* vii. 501. Stems from a branching base erect, usually about 1 to 2 ft. high. Leaves in the lower part of the plant narrow, almost terete, erect and rigid. Inflorescence occupying the upper part of the plant. Primary bracts rather distant along the simple general rhachis, rather broad and sheathing, about $\frac{1}{2}$ in. long, erect, cartilaginous, produced into a very short obtuse or truncate erect lamina, each enclosing a simple or slightly branched spike of few spikelets often scarcely exceeding the outer bract, each spikelet on a short thick pedicel enclosed in a many-nerved glume-like bract and occasionally interspersed with smaller empty bracts. Spikelets $2\frac{1}{2}$ to 3 lines long; the lower ones glabrous except a few long cilia on the margin of the 2nd glume and the nerves of the palea of the 3rd, the lowest spikelet sometimes barren. In the upper spikelet the pedicel, the nerves of the palea of the male flower and the margins of the 2nd glume usually densely ciliate or bearded. Grain much shorter than the enveloping palea.—F. v. M. *Fragm.* viii. 117.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*; Albert River, *Henne*.

17. *STENOTAPHRUM, Trin.

(Alluding to the narrow trench in which the spikelets are embedded.)

(*Diastemanthe*, Steud.)

Spikelets with 1 terminal hermaphrodite flower and a male or imperfect one below it, usually 2 to 4 together in very short spikes embedded in the alternate notches of the broad rhachis of a spikelike panicle, the rhachis of the partial spike usually produced into a short point beyond the insertion of the spikelets, and the common rhachis often disarticulating transversely between the notches when old. Glumes 4, the lowest empty and very small, the 2nd empty and the largest, membranous but rigid, 3 or 5-nerved, the 3rd and 4th flowering, rather smaller, with the nerves less prominent and of a somewhat firmer texture. Palea within both glumes of a similar consistence. Styles distinct, with long plumose stigmas. Grain enclosed in the rather rigid but thin palea and flowering glume but free from them.

A small genus dispersed over the tropical and sub-tropical regions of the New and the Old World.

1. **S. americanum** (of America), *Schrank; Kunth, Enum.* i. 138; *Benth. Fl. Austr.* vii. 500. Buffalo Grass. A glabrous rather coarse grass creeping and rooting at the base, ascending to about 1 ft., the stems somewhat flattened. Leaves obtuse, flat or involute, the sheaths usually broad and flat, ciliate at the orifice. Spikes solitary and terminal, 2 in. long or more, the rhachis flat and flexuose, 1 to 2 lines broad, readily disarticulating transversely between the notches when old, though continuous when in flower. Spikelets 2 or 3 together on very short flat or angular branches in the alternate notches of the common rhachis, the partial rhachis continued beyond the insertion of the uppermost spikelet, but not usually exceeding it, the spikelets sessile, oval-oblong, acute or acuminate, 2 to $2\frac{1}{2}$ lines long, all half immersed in the notches.—F. v.

M. Fragm. viii. 156; Bail. Ill. Mono. Gr. Q. i; *S. glabrum*, Tris. Fund. Apost. 176; *Rottboellia compressa*, Beauv. Agrost. t. 21, f. 8; *Diastemantha platystachys*, Steud. Syn. Glum. i. 860.

Hab.: Wreck Reef, Denham; also in Leichhardt's collections.

Commonly cultivated but I know of no native Queensland habitat of this grass.

18. THUAREA, Pers.

(Shortened from *Microthuarea*, an old name for *Lolium*.)

(*Microthuarea*, Beauv.; *Thuarea*, Kunth; *Ornithocephalochloa*, Kurz.)

Spikelets monœcious, in a simple one-sided spike, enclosed in a spatha-like bract, the upper (4 to 6) spikelets with 2 male flowers, the 1 or 2 lower ones with one female or hermaphrodite flower and a rudimentary or male one below it. Glumes 4, the outer one small and hyaline (or sometimes wanting?), flowering ones when perfect with a perfect palea. Styles distinct, slender, with very densely plumose brush-like stigmas. In fruit the bract under the spike falls away, the lower part of the rhachis becomes much dilated, envelops the fruiting spikelet and is said to bury itself in the sand, the fruiting glume and palea stiffened but scarcely hardened, the grain enclosed but free.

The genus contains only a single species common on sandy sea shores from the Mascarene to the Pacific Islands.

1. **T. sarmentosa** (a sea coast plant), Pers. Syn. i. 110; Benth. Fl. Austr. vii. 502. Stems creeping and rooting to a great extent, shortly ascending under the inflorescence. Leaves flat, lanceolate, broad or narrow, 1 to 2 in. long, minutely but densely or sometimes sparingly silky pubescent on both sides. Spike usually about 1 in. long, the spikelets about 2 lines; 2nd and 3rd glumes of the lower fertile one nearly equal, 7 or 9-nerved. Fruiting glume more rigid, but thin and glabrous. In the male spikelets the small outer glume often deficient, the 2nd hairy, the 3rd and 4th rather longer, glabrous, each enclosing a male flower.—Kunth, Revis. Gram. t. 35; Bail. Ill. Mono. Gr. Q. i; *T. latifolia*, *T. media* and *T. involuta*, R. Br. Prod. 198; *Ornithocephalochloa arenicola*, Kurz in Trin. Journ. Bot. iv. (1875), 392, t. 171.

Hab.: Endeavour River, Banks and Solander; Rockingham Bay, Dallachy. Tropical coast generally.

There appears to be but one species ranging from Madagascar to the Society Islands. In the more slender specimens, usually minutely and sparingly pubescent but never quite glabrous, there is usually but one fertile spikelet in the spike; in the vigorous very silky ones, such as Dallachy's, there are usually but not always two.—Benth.

19. ORYZA, Linn.

(From the Arabic name.)

Spikelets 1-flowered, flat, articulate, on short pedicels or sessile along the flexuose branches of a terminal panicle. Glumes 4, 2 outer ones small, lanceolate, 2 upper ones complicate and keeled, the outer one the largest. No 2-nerved palea. Stamens 6. Style short distinct. Grain enclosed in the hardened almost coherent upper glumes, but free from them.

A genus of very few species from the warmer regions of the New and the Old World.

1. **O. sativa** (cultivated), Linn.; Kunth, Enum. i. 7; Benth. Fl. Austr. vii. 550. Wild Rice. "Anbo-a," "Kwang-an," Princess Charlotte Bay, "Mokomurdo," Cloncurry, "Jikan," Cooktown, Roth. Stems creeping or floating at the base, ascending to several ft. Leaves long and rather broad, very scabrous especially on the upper side, otherwise glabrous, the ligula prominent scarious and jagged. Panicle narrow, erect, 6 in. to above 1 ft. long. Spikelets ovate-oblong, 3 to 4 lines long. Outer glumes scarcely $\frac{1}{2}$ line long and nerveless,

upper ones very prominently nerved, the keels usually ciliate, the outer one with 1 nerve on each side besides the nerve-like margin, closely embracing and almost connate with the inner glume, which is as long but narrower with only 1 nerve on each side near the thin margin, both glumes either shortly awned or in some cultivated varieties awnless or the outer one with a straight awn of $\frac{1}{2}$ to 8 in., and the inner with only a short point.—F. v. M. *Fragm.* viii. 115; Döll. in *Mart. Fl. Bras. Gram.* t. 1.

Hab.: Common in the Gulf country swamps. The Queensland form is the normal form of the Rice of commerce. Stockholders consider it an excellent fodder. There are probably two forms indigenous for I have received specimens with a very dark inflorescence and some of a straw-colour.

20. LEERSIA, Swartz.

(After J. D. Leers.)

(*Asprella*, *Ram. and Schult.*)

Spikelets 1-flowered, flat, articulate on short pedicels along the filiform branches of a terminal panicle. Glumes 2, complicate and keeled, the outer one the largest. No 2-nerved palea. Stamens 6 or in species not Australian 8 or fewer. Styles short, distinct. Grain enclosed in the slightly hardened glumes, free from them.

A small genus, spread over the tropical and temperate regions of the globe, the only Australian species common to the New and the Old World.

1. ***L. hexandra*** (6 stamens), *Swartz.*; *Kunth, Enum.* i. 6; *Benth. Fl. Austr.* vii. 549. Rice Grass. An erect though weak glabrous grass, attaining several feet, often rooting in the mud at the lower nodes. Leaves rather narrow, flat when fresh, mostly erect. Panicle oblong, 2 to 4 in. long, with erect or slightly spreading filiform flexuose branches. Spikelets narrow-ovate, about $1\frac{1}{2}$ line long. Glumes membranous, acute, the outer one with a prominent nerve on each side besides the marginal one; the inner glume nearly as long, but narrower, with only 1 nerve on each side near the margin. Stamens 6.—*Bail. Ill. Mono. Gr. Ql.* i.; *L. australis*, *R. Br. Prod.* 210; *Asprella australis*, *Rœm. and Schult. Syst.* ii. 267; *L. mexicana*, *Kunth, Rev. Gram.* t. 1.

Hab.: Keppel Bay, *R. Brown*; Port Curtis, *M'Gillivray*; Rockhampton, *Thozet*, *O'Shanesy*; Brisbane River, Moreton Bay, *F. v. Mueller*, *Leichhardt* and others.

The inflorescence of this grass is often infested with the blight-fungus *Thecaphora inquinans*, *B. and Br.*, and the leaves with *Puccinia graminis*, *Pers.*

21. LEPTASPIS, R. Br.

(Slender shielded.)

Spikelets unisexual, monœcious, 1-flowered, pedicellate in a loose terminal panicle. Glumes 3, the 2 outer empty ones small, broad; 3rd or flowering glume larger, membranous, 5 or 7-nerved, ovoid or globular, open down the inner side in the males, closed in the females except a small terminal but excentric orifice. Palea small, lanceolate, flat, 2-nerved. No lodicules. Stamens in the males 6 without any rudimentary ovary. No staminodia in the females. Style entire to the orifice of the glume with 3 exserted feathery stigmas. Grain enclosed in the utricular enlarged glume.

A small genus extending over tropical Asia and Africa, the only Australian species endemic.

1. ***L. Banksii*** (after Sir Joseph Banks), *R. Br. Prod.* 211; *Benth. Fl. Austr.* vii. 548. Stems from a horizontal or shortly creeping rhizome $1\frac{1}{2}$ to 2 ft. high, leafy only in the lower part. Leaves petiolate above the long narrow sheaths, lanceolate, flat, acute, 4 to 8 in. long and $\frac{1}{2}$ to 1 in. broad, glabrous or sprinkled with numerous hairs. Panicle very loose, $\frac{1}{2}$ to 1 ft. long, the filiform branches

few, spreading, distant, more or less divided. Spikelets distant, pedicellate or 1 or 2 almost sessile on the smaller branchlets, the terminal one of each branchlet usually male, the lower ones female. Outer glumes broad and concave especially in the females, almost black when dry, the largest under 1 line long, the outer one still smaller. Flowering glume nearly globular but open in the males, rather above 1 line diameter, pubescent in the females, 1 line diameter when in flower, 2 lines when in fruit and quite closed except the minute terminal orifice.—*Pharus Banksii*, Spreng. Syst. ii. 114.

Hab.: Endeavour River, *Banks and Solander*, *A. Cunningham*; Cape York, *Daemel*; Rockingham Bay, *Dallachy*.

22. TRAGUS, Desf.

(A goat.)

(*Lappago*, *Schred.*)

Spikelets 1-flowered, not awned, 2 or rarely 3 or 4 together on very short pedicels along the continuous rhachis of a simple spikelike panicle. Glumes usually 3, the outer one, next the rhachis, very minute and sometimes obsolete, the 2nd empty with 5 prominent nerves armed with short rigid hooked bristles, the 3rd or flowering glume and enclosed palea thin and hyaline. Styles distinct, slender. Grain enclosed in the thin palea and glume and rigid outer glume, free from them.

A common weed in most tropical and temperate regions in the New and the Old World.

1. **T. racemosus** (panicle raceme-like), *Desf. Döll. in Mart. Fl. Bræ.* ii., Pt. ii. t. 18. An annual spreading on the ground or ascending to from 6 in. to 1 ft. in height, usually glabrous except a few rigid cilia bordering the leaves. Leaves flat, with loose sheaths, the ligula small, split into cilia. Spikelike panicle or raceme 2 to 4 in. long, cylindrical and narrow, the very short peduncles bearing on their end 2 sessile narrow spikelets about 2 lines long, falling off together with the peduncle as little burs, the 2nd glumes with their hooked prickles forming the principal part of the spikelets, the acuminate almost aristate fruiting glumes remaining enclosed within them.—*Duthie Ind. Gr. Pl. xiv.*—*Lappago racemosa*, Willd.; *Kunth, Enum. i.* 170; *Revis. Gram. t.* 120; *Maid. Gr. N.S.W.* 64; *Benth. Fl. Austr. vii.* 506; *F. v. M. Fragm. viii.* 107; *Reichb. Ic. Fl. Germ. t.* 30.

Hab.: Rockhampton and neighbouring districts, *Bowman*, *O'Shanesy* and others; *Warwick, Beckler*; *Depot Camp, Mitchell*.

In several tropical specimens there is a third or even a fourth spikelet on each peduncle, but I have never seen more than two in the Australian ones.—*Benth.*

23. NEURACHNE, R. Br.

(Referring to the nerved glume.)

Spikelets with 1 terminal hermaphrodite flower, and very rarely a second male one below it, sessile along the continuous rhachis of a simple ovoid or cylindrical spike. Glumes 4, the 2nd the largest, fringed on each side at least in the lower half with long spreading cilia on the intramarginal nerve; 3rd glume smaller and thinner, usually with a small palea in its axil. Fruiting glume smaller thin and often hyaline, the palea also very thin, as long as or longer than the glume. Styles distinct. Grain enclosed in the thin palea and glume, free from them.

The genus is limited to Australia.

1. **N. Mitchelliana** (after Sir T. Mitchell), *Nees in Hook. Land. Journ.* ii. 410; *Benth. Fl. Austr. vii.* 508. Mulga Grass. Stems from a knotty woolly branching base erect, leafy to the inflorescence or nearly so. Leaves flat, short, spreading, ciliate with a few long hairs or the lower ones woolly-hairy. Spike

narrow-cylindrical, 1 to near 2 in. long. Spikelets about 2 lines long, with a tuft of hairs at their base. Outer glume as long as the others, many-nerved, ciliate, marked in the centre on the back with a transverse callosity bearing long rigid horizontally spreading hairs, with a broad cavity underneath it, very thin and almost hyaline, bordered by a prominent nerve on each side; 2nd glume broad to above the middle, pubescent on the back and densely fringed on each side by long spreading hairs, the upper part narrow and glabrous or nearly so; 3rd glume shorter, thin, faintly nerved and not ciliate, either empty or enclosing a small palea. Fruiting glume and palea thin and almost hyaline.—F. v. M. Fragm. viii. 200; Hook. Ic. Pl. t. 1240; Bail. Ill. Mono. Gr. Q. i.; Turner Ag. Gaz. N.S.W. ii. Pl.

Hab.: Morven.

24. PEROTIS, Ait.

(Said to be given on account of some part of the flower being wanting.)

Spikelets 1-flowered, sessile or shortly pedicellate along the continuous rachis of a loose simple spike or raceme. Glumes 3, 2 outer empty ones linear, rigid, tapering into long terminal straight awns, the lowest the longest. Terminal flowering glume much smaller, thin and hyaline, the palea still smaller. Styles very shortly united at the base, the plumose stigmas short. Grain narrow, free, longer than the terminal glume, enclosed in the 2 rigid outer ones.

The genus extends over tropical and subtropical Asia and Africa.

1. **P. rara** (rare), R. Br. Prod. 172; Benth. Fl. Austr. vi. 506. Comet Grass. Stems from a decumbent or branching base, slender, ascending to 1 ft. or rather more. Leaves linear, with subulate points, glabrous except a few marginal cilia especially at the orifice of the sheaths; ligula ciliate. Spike or raceme in some specimens 3 to 4 in., in others at least twice as long. Spikelets always numerous, at first erect at length reflexed, in some specimens almost sessile, in others on pedicels of $\frac{1}{4}$ to above $\frac{1}{2}$ line long, often ciliate with a few hairs; the spikelets very narrow, 2 to 3 lines long without the fine awns which are $\frac{1}{2}$ to 1 in. long. Outer glume with a prominent keel, sometimes glabrous, in a few specimens ciliate with rather long hairs, 2nd glume similar but rather shorter and narrower.—F. v. M. Fragm. viii. 116; Maid. Ag. Gaz. N.S.W. viii. Pl.

Hab.: Between Norman and Gilbert Rivers, *Gulliver*; Cape York Peninsula; Port Curtis and Cape Upstart, *M'Gillivray*; Port Denison, *Fitzalan*; Rockhampton and numerous stations in the south, *Bowman*, *O'Shanesy* and many others; Balonne River, *Mitchell*; towards Cooper's Creek, *Nettson*.

25. ZOYSIA, Willd.

(After Baron Charles de Zoys.)

Spikelets 1-flowered, not awned, nearly sessile in a close spike, not distichous, the rachis continuous. Glumes 2, the outer one broad, complicate, keeled, the inner flowering one much smaller, thin and hyaline. Palea still smaller. Styles distinct. Grain free, enclosed in the somewhat hardened outer glume.

Besides the Australian species, which is common in maritime sands of tropical and eastern Asia and New Zealand, there appear to be one or two natives of Japan or China.

1. **Z. pungens** (pungent), Willd.; Kunth, Enum. i. 471; Benth. Fl. Austr. vii. 506. Rhizome creeping in the sands to a great extent, with erect stems rarely above 6 in. high. Leaves flat or convolute, with rigid subulate often pungent points, glabrous except a few cilia at the orifice of the rather loose sheaths. Spike terminal, 1 to 1½ in. long. Spikelets erect, closely appressed in the notches of the rachis, 1½ to 2 lines long. Outer glume rather acute, broad, smooth and shining, the sides nerveless. Flowering glume completely enclosed, usually much smaller thin and hyaline, but sometimes more than half the outer

one and rather more rigid.—R. Br. Prod. 208; F. v. M. Fragm. viii. 116; Benth. Fl. Hongk. 418, with the synonyms adduced; Sieb. Agrostoth. n. 52; *Z. sinica*, Hance in Seem. Journ. Bot. 1869, 168; Buch. Ind. Gr. N.Z. Pl. xiiia.

Hab.: Port Curtis and Moreton Island, *M'Gillivray*; Stradbroke Island, a sandy shore grass.

26. *COIX, Linn.

(A name applied by Theophrastus to some reed-like plant.)

A tall annual or perennial grass. Leaves long and broad. Spikes numerous axillary and terminal; lower spikelets solitary, female, enclosed in an at length hardened polished nut-like bract, through the apex of which the pedicelled male portion protrudes. Male spikelets 2 to 3-nate at each node of the rhachis, 1 sessile and 1 or 2 pedicellate, lanceolate. Glumes 4, 1st and 2nd subequal, empty, rigid or herbaceous; 1st keeled along the inflexed margins; 3rd and 4th hyaline, paleate, triandrous or empty. Female spikelets ovoid, acuminate; glumes 4, 1st chartaceous; 2nd to the 4th successively thinner; 4th paleate. Staminiodia minute. Lodicules none. Ovary ovoid, styles 2, free slender. Grain orbicular or subcylindrical, ventrally furrowed, enclosed in the hardened globose ovoid or cylindrical involucre.

Found indigenous or naturalised in tropical Asia, Africa, America and New Zealand.

1. *C. lachryma-Jobi* (Job's tears) Linn. *Sp. Fl.*; Hook. in *Fl. Brit. Ind.* vii. 100. Job's Tears. Stems 3 to 6ft. high, stout, leafy, rooting at the lower nodes. Leaves 4 to 18in. long 1 to 2in. broad, undulate, cordate at the base; the sheaths smooth; ligula very short, glabrous. Spikes 2 to 3in. long, suberect, pedunculate; male spikelets 3 or 2 with an imperfect one, 8 lines long; 1st glume narrowly winged. Fruit ovoid or spherical, 3 to 4 lines long, bony, bluish-grey.—Mart. *Fl. Bras.* ii. t. 10.

Hab.: This the typical plant of the genus is sometimes met with as a stray from cultivation.

27. POLYTOCA, R. Br.

(From *poly*, many, and *tokos*, a birth.)

(*Chionachne*, R. Br. in *Fl. Austr.*)

Tall branching grasses, nodes often bearded; flowering branches fasciculate, spathaceous. Leaves long, flat. Spikes solitary or paniculate, bisexual and female below, or the upper male only, rhachis jointed; spikelets geminate, a sessile and a pedicellate one. Male spikelets lanceolate, 2-flowered; glumes 4, 1st many-nerved, 2 keeled; 2nd 5 to 7-nerved; 3rd and 4th hyaline, paleate, triandrous; anthers very long. Lodicules cuneate. Female spikelets imbricate, the pedicellate imperfect, its pedicel confluent with the rhachis; glumes of sessile spikelet 4, 1st oblong, coriaceous, margins inflexed embracing the rhachis, at length crustaceous; 2nd thin, acuminate; 3rd hyaline, epaleate; 4th hyaline, paleate, fertile. Staminiodia and lodicules wanting. Ovary minute; styles long, stigmas slender. Grain very small, orbicular, enclosed in the hardened outer glumes.—Hook. in *Fl. Brit. Ind.* vii. 100.

Species few, Asiatic and Australian.

Stems often tall.

Peduncles several in the upper leaf-sheaths. Bracts spreading under the spike. Spike 1in. or rather longer, with only 1 female spikelet . . .

1. *P. barbata*.

Peduncles solitary in the leaf-sheaths, the bract closely embracing the base of the spike. Spike 3 to 4in. long, with 3 to 6 female spikelets . . .

2. *P. cyathopoda*.

Stems very slender erect, about 1ft. high . . .

3. *P. Sclerachne*.

1. **P. barbata** (bearded), *Stapf. in Hook. Fl. Brit. Ind.* vii. 102. An erect stout branching grass, attaining several feet, but said to be annual. Leaves flat, broad or narrow, very scabrous, the sheaths usually sprinkled with rigid spreading hairs. Nodes glabrous or bearded. Peduncles slender but rigid, usually several in the upper axils, very unequal in length but the longest shorter than the leaf, each bearing a broadly lanceolate acuminate bract at the base of the spike, usually about 1 in. long, at first close and sheathing but at length opening out. Spike scarcely exceeding the bract. Female spikelet solitary at the base, ovoid-oblong, nearly 4 lines long; males 6 to 10 in pairs, 4 to 5 lines long, narrow, rather acute. Rhachis of the spike articulate above and below the female spikelets, the peduncle dilated and cup-shaped under it.—*Coix barbata*, Roxb. Hort. Beng. 66 and Fl. Ind. iii. 569; *Chionachne barbata*, R. Br.; Benth. Fl. Austr. vii. 515.

Hab.: Burdekin River, *Bowman*; Cardwell district, *Bailey*.

Widely spread over East India and originally described as *Coix arundinacea*, Willd. Spec. Pl. iv. 203. A name preoccupied by Lamarck.

2. **P. cyathopoda** (bract cup-shaped), *Bail.* An erect grass of several feet, less branched than *C. barbata*. Leaves long and flat, scabrous on the upper surface, the sheaths either quite glabrous or sprinkled with rigid hairs arising from tubercles. Peduncles usually solitary within the leaf-sheaths, with a narrow sheathing bract shorter than the spike and remaining closed over its base. Spikes 3 to 4 in. long with 8 to 6 female spikelets at the base, exactly superposed in a single row and closely appressed, the hard shining outer glume 4 to 5 lines long and embracing the rhachis as in *C. barbata*, the female part of the spike usually included in the leaf-sheath even when ripe. Male spikelets numerous in the upper part of the spike, usually turned in pairs to one side, 4 to 6 lines long, the glumes varying from obtuse to acutely acuminate.—*Sclerachne cyathopoda*, F. v. M. Fragm. viii. 116; *Chionachne cyathopoda*, F. v. M.; Benth. Fl. Austr. vii. 516.

Hab.: Gulf of Carpentaria, *Landsborough*; Dawson and Comet Rivers, *Leichhardt*; Rockhampton and neighbourhood, *Bowman*, *Thozet*, *O'Shanesy*. Common by the northern rivers.

8. **P. Sclerachne** (*Sclerachne*-like), *Bail.* Stems erect, slender and leafy, from a knotty more or less woolly base, 1 ft. or more high. Leaves erect, the sheath closed with rather long white silky hairs, and prominently nerved, ligula short-ciliate. lamina narrow, tapering to a fine point, more or less hairy but the hairs very short. Inflorescence axillary, very short; on the specimens examined there were a few pedicels which probably bore male spikelets. Female spikelets nearly sessile, glumes hardened and smooth, outer 2 lines long, keeled and faintly-nerved, obtuse, margins thin, 2nd glume thick, hard, almost enclosing the rest, and about $\frac{1}{2}$ line longer than the others, and bearing a blunt point; 3rd glume thinner, striate, as long as the outer; 4th glume almost hyaline. Palea narrow. Grain free, dark-brown, and about 1 line long.—*Chionachne Sclerachne*, *Bail. Bot. Bull.* 2.

Hab.: Lloyd Bay, Cape York Peninsula, *T. A. Gulliver*; Somerset, *Bailey*.

It is but a poor-looking wiry grass, but horses are said to be fond of it.

28. *EUCHLÆNA, Schrad.

(Well glumed.)

Male inflorescence terminal, paniculate. Female in axillary spikes, enclosed in the glumes like the maize, to which this genus is very closely allied. The female spikelets are, however, superposed in a single row on an articulated rhachis in a single spike.

1. ***E. luxurians*** (luxuriant), *Dur. et Ascher. in Bull. Mens. Soc. Linn. Paris* No. 14; *Bot. Mag. t. 6414*. Téosinté.

This is a tall many-stemmed grass, which is cultivated in many warm countries for fodder; it thrives well in Queensland but although having been more or less in cultivation for the past 20 years has not found much favour with farmers.

Hab.: Mexico. Now and again met with as a stray from cultivation. Some have considered it the wild state of the *zea* (maize), which is not known in a wild state.

29. **ZEÄ*, Linn.

(The Greek name of some undetermined kind of grain).

A tall stout annual monœcious grass. Leaves broad and flat. Spikelets unisexual, males in terminal racemose panicles; females in solitary axillary stout sheathed spikes, rhachis thick, inarticulate, spongy. Male spikelets 2-flowered, 2-nate, a sessile and a pedicellate one at each of the alternating teeth of the inarticulated rhachis; glumes 4, acute, 1st and 2nd subequal, membranous, empty; 1st enclosing the hyaline paleate 3rd and 4th. Lodicules fleshy. Stamens 3, anthers linear. Female spikelets 1-flowered, sessile, densely crowded in many vertical series on the thick cylindrical rhachis; glumes 4, membranous, 1st and 2nd very broad, obtuse or emarginate; 3rd hyaline, paleate, empty; 4th hyaline, often 2-flowered. Lodicules none. Ovary obliquely ovoid, plano-convex; style very long, 2-fid, branches papillose. Grain large, subglobose or flattened, surrounded by the marcescent glumes.

1. ***Z. Mays*** (the native Tupi name), *Linn. Sp. Fl.* 976, *Hook. in Fl. Brit. Ind.* vii. 102.

The only species, extensively cultivated in warm countries, sometimes met with as a stray from cultivation. Although usually the male inflorescence is quite distinct from the female such is not always the case for frequently one meets with scattered grains in the male inflorescence and I once obtained a fairly well formed cob which, however, was wanting or nearly so the clothing of glumes, and it is also not uncommon to meet with male or abortive flowers at the summit of the cob or female spike.

The fungus *Tilletia epiphylla*, B. and Br., is sometimes found upon the leaves.

30. DIMERIA, R. Br.

(Of 2 parts, alluding to the 2 spikes.)

Spikelets 1-flowered, almost sessile, inserted singly on the alternate notches of slender unilateral spikes, which are either solitary or more frequently 2 or 3 together on a terminal peduncle; the rhachis not articulate, and frequently a tuft of short hairs under each spikelet. Glumes 4, 2 outer empty ones linear, rigid, keeled, not awned, the 3rd also empty but smaller, thin and hyaline; terminal glume thin and transparent, entire or 2-lobed, with a slender awn either terminal or in the terminal notch, twisted at the base and bent back at or below the middle. Palea minute or none. Styles distinct. Grain free, narrow, enclosed in the outer glumes.

A small genus extending over tropical Asia. Of the three Australian species one is also in East India, the other appears to be endemic.

Spikelets nearly 2 lines long, with a tuft of hairs at the base. Outer

glumes rather thick. (Stamens 3?)	1. <i>D. acinaciformis</i> .
Spikelets about 1 line long, without any or only a very minute tuft of	
hairs. Outer glumes thin. Stamens 2	2. <i>D. ornithopoda</i> .
Spikelets about 1 line long. Outer glume setaceous	3. <i>D. glabriuscula</i> .

1. ***D. acinaciformis*** (scimitar-like), *R. Br. Prod.* 204; *Benth. Fl. Austr.* vii. 523. A slender annual, branching at the base, with filiform stems 6 in. to 1 ft. high. Leaves few near the base, narrow, ciliate with a few long hairs. Spikes 2, flat, the filiform flexuose rhachis 1 to 1½ in. long. Spikelets narrow-linear, nearly 2 lines long, with a prominent tuft of white hairs or cilia at their

base. Outer glume rather thick, complicate, not bordered, the keel minutely serrate-ciliculate; 2nd glume rather longer, nearly as thick but bordered by a thin hyaline margin, the keel more prominent at the end. Terminal flowering glume very narrow and hyaline, shortly 2-lobed, distinctly keeled, the keel produced into a capillary twisted and bent awn of about $\frac{1}{2}$ in. Stamens 3 (*R. Brown*).

Hab.: Endeavour River, *Banks and Solander*.

2. *D. ornithopoda* (bird's foot), *Trin. Fund. Agrost.* 167, t. 14; *Hook. in Fl. Brit. Ind.* vii. 104. A slender branching annual, with filiform stems 6 in. to 1 ft. high, erect or weak and decumbent. Leaves narrow, ciliate, the sheaths sprinkled with long spreading hairs, the ligula short, truncate. Spikes 2, filiform, 1 to $1\frac{1}{2}$ in. long. Spikelets about 1 line long, very narrow, without any or rarely an exceedingly minute tuft of hairs at the base. Glumes thinner than in *D. acinaciformis*, the outer one usually sprinkled with a few hairs and the 2nd shortly ciliate on the hyaline margins, the 3rd very small, or perhaps sometimes deficient. Terminal flowering glume rather shorter than the outer ones, scarcely notched, the awn appearing quite terminal.—*D. tenera*, *Trin. in Mem. Acad. Petersb.* ser. 6, ii. 225; *Benth. Fl. Austr.* vii. 528; *Bail. Ill. Mono. Gr.* Ql. i; *D. psilobasis*, *F. v. M. Fragm.* vii. 104.

Hab.: Cairns, *Bailey*; Tully River, *J. F. Bailey*.

Widely spread over East India, from the Peninsula to Nepal and Mergui.

8. *D. glabriuscula* (nearly glabrous), *Bail. 3rd Suppl. Syn. Ql. Floræ.* A slender, erect, glabrous, slightly branching, annual grass, of from 9 to 18 in. in height. Leaves with narrow erect laminæ 1 to $1\frac{1}{2}$ in. long, the ligula truncate, and prominent for the size of leaf and stem. Spikes 2, filiform, $1\frac{1}{2}$ to 2 in. long; spikelets about 1 line long. Outer glume setaceous, slightly spreading; the others with rigid keel, and broad hyaline but not ciliate margins; 3rd glume small, hyaline; flowering glume very short, hyaline, with terminal awn about 2 lines, twisted in the lower half.

Hab.: Harvey's Creek.

This species is nearly allied to the Queensland form of *D. ornithopoda*, *Trin.*, but differs from that species in its more rigidly erect growth, besides being glabrous, and wanting the ciliae to the hyaline margins of the second glume.

81. IMPERATA, Cyr.

(After Ferranti Imperati.)

Spikelets with 1 or rarely 2 flowers, usually in pairs one sessile the other pedicellate along the slender continuous rhachis of the short branches of a long cylindrical spikelike panicle, densely silky with the long hairs surrounding and seated on the spikelets. Glumes 4, all thin hyaline and awnless, 2 outer empty ones usually hairy, the 3rd empty or rarely enclosing a flower smaller and without hairs; terminal flowering glume still smaller. Palea usually truncate and jagged at the top. Stamens 2, or 1 only in species not Australian. Styles distinct. Grain small, free, enclosed in the outer glumes.

Besides the Australian species which is widely spread over the temperate and tropical regions especially of the Old World, the genus contains others chiefly American.

1. *I. arundinacea* (reed-like), *Cyr.*; *Kunth, Enum.* i. 477; *Benth. Fl. Austr.* vii. 536. Blady Grass. "Dirnbur," Cape Bedford, *Roth*. A stiff erect perennial 1 to 8 ft. high, glabrous except sometimes a tuft of hairs at the nodes. Leaves erect, narrow, often longer than the stem. Spikelike panicle very dense, 8 to 8 in. long, regularly cylindrical, silvery white with the long silky hairs concealing the glumes, the dark-coloured stigmas and oblong-linear anthers alone protruding;

spikelets $1\frac{1}{2}$ to near 2 lines long; outer glume 5 or 7-nerved, the 2nd 3 or 5-nerved, the 3rd usually empty.—R. Br. Prod. 204; Host, Gram. Austr. iv. t. 40; Reichb. Ic. Fl. Germ. t. 55; Duthie Ind. Gr. pl. xv; Turner Austr. Gr.

Hab.: Common in all parts where the land is damp.

Leaves used for making dilly-bags.—*Roth*.

The 3rd glume is usually empty, but sometimes the 3rd and 4th glumes are nearly similar, each with a hermaphrodite flower in its axil.

82. POLLINIA, Trin. not of Spreng.

(After Cyrus Pollini.)

Spikelets 1-flowered, in pairs in the alternate notches of the articulate rhachis of simple spikes, one sessile or shortly pedicellate, the other on a longer pedicel, but the two otherwise similar, the spikes sessile and clustered or rarely solitary at the end of the common peduncle. Glumes 4 or 8, outer one the largest, membranous, awnless with a truncate toothed or ciliate tip, 2nd usually thinner, keeled, acute or produced into a fine straight awn, 3rd thin and hyaline or deficient; terminal or 4th glume a twisted and bent awn, contracted and flexuose or hyaline, dilated and 2-lobed at the base as in *Andropogon*. Palea small and hyaline or none. Styles distinct. Grain enclosed in the outer glumes and free from them.—Habit of *Andropogon*, sect. *Gymnandropogon*, the spikes silky-villous, rufous or silvery-white as in *A. sericeus* and its allies, but the pedicellate spikelets are all except sometimes at the base of the spike fertile, which is never the case in *Andropogon*.

The genus extends over tropical Asia and Africa.

Third glume very small and hyaline or none. Awn contracted at the base into a narrow flexuose stipes.

Spikes several, often numerous. Spikelets both pedicellate, 2nd glume with a fine straight awn. Awn of the terminal glume long.

Annual. Spikes $1\frac{1}{2}$ to 2 in. long 1. *P. articulata*.

Perennial. Spikes 3 to 5 in. long 2. *P. irritans*.

Spikes 2 or 3. Spikelet sessile; 2nd glume not awned. Awn of the terminal glume short and fine 3. *P. fulva*.

Third glume not much shorter than the 2nd, thin and hyaline. Awn with a narrow hyaline 2-lobed dilatation at the base.

Spikes 3 to 4 in., spikelets $1\frac{1}{2}$ line, awns scarcely $\frac{1}{2}$ in. long 4. *P. argentea*.

1. ***P. articulata*** (articulate), Trin. in Mem. Acad. Petersb. ser. 6, iii. 90; Benth. Fl. Austr. vii. 525. Closely allied to *P. irritans*, but smaller and more slender and apparently annual, 6 in. to $1\frac{1}{2}$ ft. high. Leaves very narrow, flat or filiform. Spikes usually several, sometimes numerous, slender, $1\frac{1}{2}$ to 2 in. long, the rhachis articulate but not breaking so readily as in some species. Spikelets exceedingly deciduous, under 1 line long, both pedicellate but one pedicel longer than the other, the rhachis and pedicels shortly ciliate. Outer glume obtuse, rather broad, faintly nerved, ciliate, 2nd glume rather narrow, obtuse but the keel produced into a fine straight awn; 3rd glume deficient (or very minute?). Awn or 4th glume contracted at the base into a flexuose stipes without any hyaline dilatation, ciliate in the lower twisted part, attaining 2 in. in the larger specimens. No palea.—*Erianthus articulatus*, F. v. M. Fragm. viii. 118; *Pogonatherum contortum*, Brongn. in Duperr. Voy. Bot. 90, t. 17.

Hab.: Northern localities.

Var. *minor*. Spikes 2 to 4, scarcely above 1 in. long.

Hab.: Rockingham Bay, *Dallachy*; and other northern localities.

The species is also in the Malay Archipelago.

2. ***P. irritans*** (irritating), Benth. Fl. Austr. vii. 525. Stems 2 ft. high or more. Leaves usually long and narrow, glabrous as well as the nodes. Spikes several, usually numerous, 3 to 5 in. long, in a terminal cluster with a very short common rhachis, the slender rhachis of the spikes as well as the pedicels shortly

ciliate. Spikelets both pedicellate but one pedicel longer than the other, about 1 line long. Outer glume rather broad, obtuse and more or less toothed at the end, the nerves faint except a more prominent one near each margin; 2nd glume narrow, the keel produced into a fine straight awn, 3rd very small and hyaline. Awn or terminal glume about 2 in. long, contracted at the base into a flexuose stipes without any hyaline dilatation, twisted and ciliate in the lower half. No palea.—*Saccharum irritans*, R. Br. Prod. 208; *Erianthus irritans*, Kunth, Enum. i. 479; F. v. M. Fragm. viii. 118.

Hab.: Keppel Bay, *R. Brown*; Endeavour River and Cleveland Bay, *A. Cunningham*; Cape York, *Daemel*; Rockingham Bay, *Dallachy*.

3. *P. fulva* (tawny), *Benth. Fl. Austr.* vii. 526. Stems either slender and 1 to 1½ ft. high, or stouter more branching at the base and attaining 2 to 4 ft., the nodes glabrous or shortly bearded. Leaves rather narrow tapering to fine points, the orifice of the sheaths and ligula usually ciliate and sometimes the sheaths hairy. Spikes 2 or 3 sessile and near together in a terminal cluster but not quite digitate, 1½ to 2½ in. long, covered with silky hairs of a rich brown. Spikelets mostly about 2 lines long, but variable in size, all similar or the pedicellate ones rather narrower. Outer glume truncate or denticulate at the end, faintly nerved, 2nd nearly as long, narrower, slightly keeled, truncate, 3rd very minute or more frequently entirely deficient. Awn or terminal glume slender, rarely ½ in. long, contracted into a flexuose stipes or slightly dilated at the base, hyaline and bifid. Styles very shortly united.—*Turner Ag. Gaz. N.S.W.* ii. Pl. xxxiv; *Saccharum fulvum*, R. Br. Prod. 208; *Erianthus fulvus*, Kunth, Enum. i. 479; F. v. M. Fragm. viii. 118.

Hab.: Islands of the Gulf of Carpentaria, Shoalwater, *R. Brown*; Rockhampton, *O'Shanesy*; and various localities in South Queensland, *Leichhardt* and many others.

4. *P. argentea* (silvery), *Trin. in Bull. Sc. Acad. Petersb.* i. 71. Stems 2 to 3 ft. high or sometimes more, the nodes not bearded. Leaves narrow, often sprinkled with a few long hairs and ciliate at the orifice of the sheaths. Spikes usually more than 3 and sometimes many, clustered at the end of the peduncle, 3 to 4 in. long, slender, the silky hairs of the rachis and pedicels shorter than the spikelets. Spikelets about 1½ line long, the sessile and pedicellate ones similar. Outer glume membranous, truncate or 2-toothed, faintly-nerved, bordered by long cilia, 2nd narrower, scarcely ciliate, 3rd nearly as long, almost acute. Awn or terminal glume fine, scarcely ½ in. long, the hyaline base very narrow with small narrow terminal lobes.—*Duthie In. Gr. Pl.* liii; *Erianthus Roxburghii*, F. v. M. Fragm. viii. 117; *Pollinia tristachya*, Thw. Enum. Ceyl. Pl. 368; *Benth. Fl. Austr.* vii. 547.

Hab.: Rockingham Bay, *Dallachy*.

Common in East India.

88. ISCHÆMUM, Linn.

(Woolly seeds of a species said to have been used to stop blood.)

(*Spodiopogon*, *Trin.*; *Meoschium*, *Beauv.*; *Hologamium*, *Nees.*)

Spikelets in pairs in the alternate notches of the articulate flexuose rachis of simple spikes, 1 sessile with 1 hermaphrodite terminal flower and a male one below it, the other pedicellate and either similar or with only 1 hermaphrodite or 1 or 2 male flowers or reduced to empty glumes, the spikes either solitary or 2 or more, sessile or nearly so at the end of the common peduncle. Glumes in the sessile spikelet 4, the outer one the largest, awnless, truncate or 2-toothed at the top; 2nd glume keeled and sometimes produced into a short straight awn, 3rd glume rather smaller, thin, enclosing a palea and 3 stamens; terminal glume a

twisted and bent awn, attenuate or hyaline and bifid at the base as in *Andropogon*. Palea small and thin or none. Styles distinct. Grain enclosed in the glumes but free from them.

The genus is chiefly Asiatic with a few tropical African and American species. Spikelets both 2-flowered and awned. Outer glume rigid. Spikes 2 or 3,

rarely 4, erect, often appressed so as to appear like 1 cylindrical spike.

Nodes bearded. Stems 2 to 8ft. high. Awn exserted.

Spikes 3 to 4in., spikelets 4 to 5 lines long 1. *I. triticeum*.

Spikes 1½ to 3in., spikelets about 3 lines long 2. *I. australe*.

Nodes bearded. Stems creeping or diffuse, shortly ascending.

Glabrous. Rhachis of the spike not ciliate. Outer glume winged at the top. Awn concealed in the spikelet 3. *I. muticum*.

Sessile spikelet 2-flowered, awned. Pedicellate spikelet unawned, with a male or without any flower.

Spike rigid. Articles of the rhachis and pedicels ovate, convex, smooth and shining resembling sessile spikelets 4. *I. fragila*.

Spike solitary. Pedicellate spikelets lanceolate, flattened, with 2 male flowers 5. *I. laxum*.

1. *I. triticeum* (Triticum-like), *R. Br. Prod.* 205; *Benth. Fl. Austr.* vii. 519. Very near *I. muticum*, but a coarse plant, ascending to 2 or 8ft. Leaves mostly long and broad, contracted at the base or scarcely cordate, glabrous or the lower sheaths hairy. Spikes 2 together, 3 to 4in. long. Spikelets 4 to 5 lines long, more acuminate than in *I. muticum*. Outer glume smooth and shining at the base, several-nerved and often ciliate with a few hairs at the end, the wings of the lateral nerves often unequal; inner glumes rather rigid, the 3rd with a rigid palea and male flower, the 4th under the terminal flower more hyaline, shortly 2-fid, the awn usually exserted and sometimes ½in. long. Pedicellate spikelet nearly similar, but as in *I. muticum* rather narrower, the wings and nerves irregular, and the awn often shorter.—*Andropogon triticeiformis*, Steud. *Syn. Glum.* i. 376.

Hab.: Keppel and Shoalwater Bays and Broadsound, *R. Brown*; Endeavour River, *A. Cunningham*; Cape York and Port Curtis, *M. Gillivray*; Moreton Bay, *F. v. Mueller*.

2. *I. australe* (Australian), *R. Br. Prod.* 205; *Benth. Fl. Austr.* vii. 519. Stems from a shortly decumbent base or creeping rhizome erect, 2 to 8ft. high, but not stout. Leaves rather narrow, glabrous or slightly hairy in the typical form, the nodes always bearded, the upper sheaths very long. Spikes 2 together on a long peduncle, sessile and erect, 1½ to 3in. long, the rhachis and pedicels slightly ciliate. Spikelets 3 lines long or scarcely more; otherwise the same as in *I. triticeum*. Awn of the sessile spikelet ½ to ¾in. long, of the pedicellate spikelet shorter or reduced to a short point.—*Andropogon eryptatherus*, Steud. *Syn. Glum.* i. 376.

Hab.: Brisbane River, Moreton Bay, *F. v. Mueller*, *C. Stuart*; also in *Bidwill's* collection.

The glumes of this and other species of the genus are often infested with the fungus *Cladosporium herbarum*, *Link.*

Var. *villosum*. Leaves more hairy and very scabrous. Rhachis and pedicels of the spikes densely ciliate with long hairs and the spikes often above 3in. long. *I. villosum*, *R. Br. Prod.* 205; *Andropogon villiferus*, Steud. *Syn. Glum.* i. 376.

Hab.: Gould Island, *M. Gillivray*; Mount Wheeler, *Thozet*.

3. *I. muticum* (pointless), *Linn.*; *Kunth, Enum.* i. 512; *Benth. Fl. Austr.* vii. 520. Stems diffuse or creeping at the base, ascending to from 6in. to above 1ft., rather stout and leafy to the inflorescence. Leaves lanceolate, rather short, often cordate at the base, quite glabrous, the upper one reduced to a sheathing bract very near or close to the spikes. Spikes 2 together but sessile erect and closely appressed so as to appear like one thick cylindrical spike of 1 to 2in., the rhachis and thick pedicels quite glabrous. Spikelets about 3 lines long. Outer glume of the sessile one paleaceous, broad, obtuse acute or mucronate, several-nerved, the 2 lateral nerves winged towards the top, 2nd glume narrower thinner,

acute, the keel winged towards the end, 3rd thin but rigid and acute, with a male flower, the 4th under the hermaphrodite flower thin and hyaline, entire and awnless or slightly notched with a minute awn. Pedicellate spikelet narrower, but containing a hermaphrodite flower.—*Andropogon muticus*, Steud. Syn. Glum. i. 374; F. v. M. Fragm. viii. 120 partly.

Hab.: Rockingham Bay, *Dallachy*.

Widely spread on the sea-coasts of tropical Asia and the South Pacific Islands.

4. **I. fragile** (frail), *R. Br. Prod.* 205; *Benth. Fl. Austr.* vii. 522. Stems slender, ascending or erect, $1\frac{1}{2}$ to 2ft. high. Leaves narrow, those on the stem with long and loose sheaths, the uppermost sheath close and slender. Spike single, about $1\frac{1}{2}$ in. long, rigid, on a long peduncle. Articles of the rhachis and pedicels of the barren spikelets similar to each other, about as long as the sessile fertile spikelet, ovate-turgid almost hemispherical, hard and shining outside, the inner cavity closed by a thin membrane, the 2 assuming the appearance of 2 collateral spikelets, the fertile spikelet sessile between them on the other side of the rhachis, about 2 lines long, with a tuft of brown cilia at its base. Outer glume broad, rigid, faintly 5-nerved, notched at the end, with 2 prominent membranous wings, 2nd glume keeled and tapering to a fine point or very short awn, 3rd thin, almost hyaline with a palea as long and not thinner and 8 stamens, 4th terminal glume very thin and hyaline, bifid, the awn twice or three times as long as the spikelet. Pedicellate spikelet smaller, reduced to 2 membranous glumes, the outer one broad and rather obtuse, the inner narrow, tapering to a point.

Hab.: Endeavour River, *Banks and Solander*; Port Denison.

5. **I. laxum** (loose), *R. Br. Prod.* 205; *Benth. Fl. Austr.* vii. 522. A rather slender grass of 2 to 3ft., quite glabrous. Leaves narrow, often subulate, the ligula short, ciliate. Spike single, dense, sometimes slightly curved, 2 to 4 or rarely 5in. long; rhachis and pedicels ciliate. Sessile spikelet narrow, scarcely flattened, 3 to 4 lines long; outer glume acutely acuminate, with 2 rather prominent nerves and obscure ones between them; 2nd glume thin, produced into a long fine straight awn; 3rd hyaline, with a male flower; terminal glume hyaline, narrow, bifid, with a long bent awn. Pedicellate spikelet more conspicuous, much flattened as well as the pedicel. Glumes acutely acuminate, the outer one broadly lanceolate, with 5 very prominent nerves, the 2nd thin, scarious, faintly 8-nerved, two flowering glumes and paleas thin and hyaline, both with male flowers or the 3rd empty.—*Turner Ag. Gaz. N.S.W.* ii. Pl. xxxvii; *Andropogon nervosus*, Rottb.; *Kunth, Enum.* i. 507; *Hologamium nervosum*, Nees in *Edinb. N. Phil. Journ.* xviii. 185.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*; Peak Downs, *Burkitt*; Rockhampton and neighbourhood, *Bowman, Thozet, O'Shanesy*; also in *Leichhardt's* collection.

The species extends over tropical Asia and Africa.

84. EREMOCHLOA, Buse.

(Desert grass.)

Perennial grasses. Leaves more or less equitant rigid. Spikelet 1-flowered flat, secund, solitary, sessile at each internode of a terminal narrow compressed spike, with a rudimentary pedicellate one. Glumes 4, the 1st nearly flat, oblong, smooth, coriaceous, not awned, margins pectinate; 2nd ovate-lanceolate, acuminate, chartaceous, 3-nerved; 3rd hyaline, oblong, obtuse, paleate, male; 4th smaller, hyaline, oblong, obtuse, 1-nerved, female or bisexual; palea oblong-lanceolate. Lodicules obliquely truncate. Stamens 8, anthers long. Stigmas short, feathery.

Species few, East Asia and Australia.

1st glume broadly-oblong, wings fan-shaped 1. *E. muricata*.
1st glume elliptic subacute, wings small rounded 2. *E. bimaculata*.

1. *E. muricata* (rough with short tubercles), *Hack. Mono. Andro.* 262; *Hook. in Fl. Brit. Ind.* vii. 140. Quite glabrous, shortly creeping, stems compressed, 6 to 18 in. high. Leaves 8 to 6 in. long, 2 to 3 lines broad, tips rounded apiculate. Spike often falcate, 2 to 5 in. long, linear; rhachis glabrous, brittle, not excavated. Spikelets 2 lines long, 1st glume broadly ovate-oblong with 2 fan-shaped terminal wings, dorsally slightly convex, many-nerved, wings crenate; spines very many upcurved, nearly as long as the glume is broad. Pedicellate spikelet a single lanceolate acuminate coriaceous nerved glume with thin inflexed margins.—*Andropogon pectinatus*, Steud. Syn. Gram. 869.

Hab.: Generally met with on dry ridges in southern and a few northern localities. Also in India.

2. *E. bimaculata* (2 spotted), *Hack. Mono. Andro.* 268; *Hook. in Fl. Brit. Ind.* vii. 140. Habit etc., of *E. muricata*, but leaves much narrower, narrowed at the obtuse tip; spikes more slender; spikelets much narrower, with fewer nerves and shorter spines, callus puberulous. First glume elliptic subacute with 2 small low rounded terminal wings; spines shorter than the glume is broad.—*Ischamum pectinatum*, Benth. Fl. Austr. vii. 521.

Hab.: On dry ridges. The above two species are both included in the Fl. Austr., under the name of *Ischamum pectinatum*.

85. POGONATHERUM, Beauv.

(Probably referring to the hair-like awns.)

Delicate annual or perennial grasses with capillary peduncles. Leaves erect. Spikelets 1 to 2-flowered, binate (usually a sessile hermaphrodite and pedicellate female) imbricate on the fragile rhachis of a solitary terminal capillary spike, 2-awned; awns capillary, often interlaced. Glumes 4, membranous; 1st oblong, concave, tip truncate or rounded, long ciliate; 2nd as long as the first or rather longer, tip acute or 2-toothed, awn terminal; 3rd (in the upper spikelet wanting) hyaline, paleate, male; 4th hyaline, narrow, 2-fid, long awned, palea oblong, glabrous. Lodicules wanting. Stamens 1 or 2, anthers long. Stigmas slender. Grain free, oblong.

1. *P. saccharoideum* (Saccharum-like), *Beauv. Agrost.* 56, t. ii. f. 7. A slender branching often tufted grass, the stems leafy throughout, and from 1 to 2 ft. high, nodes slightly bearded. Leaves narrow, $1\frac{1}{2}$ to $2\frac{1}{2}$ inches long, tapering to fine points, sheaths slightly hairy but with long silky hairs at the top similar to the ligula. Spike from 1 to $1\frac{1}{2}$ in. long, on a slender thread-like peduncle, the silky hairs and awns often assuming a golden hue. Spikelets about 1 line long, the 5 spreading hair-like awns $\frac{1}{2}$ to $\frac{3}{4}$ in. long and more or less twisted.

Hab.: Johnstone River, W. R. Kefford; and other tropical localities.

86. ARTHRAXON, Beauv.

(Jointed at the stem.)

(*Batratherum*, Nees.)

Spikelets 1-flowered, sessile in the alternate notches of the articulate rhachis of simple spikes, with a short pedicel in the same notch usually without any spikelet, the spikes sessile or shortly pedunculate in a simple terminal panicle. Glumes 4, the outer one the largest, membranous, several-nerved, the 2nd keeled, acute, the 3rd smaller, hyaline, all awnless, 4th or terminal glume shorter than the 2nd, hyaline but keeled, with a dorsal awn arising from the base but twisted and bent as in *Andropogon*. Palea very small and hyaline. Styles distinct. Grain enclosed in the outer glumes but free from them.—Stems usually weak or slender with short broad leaves.

The genus is generally spread over tropical Asia and Africa, the only Australian species apparently a slight variety of a common Indian one.

1. **A. ciliare** (ciliate), Beauv. *Agrostogr.* 111, t. 11, f. 6; *Benth. Fl. Austr.* vii. 524. Stems slender, decumbent or creeping at the base, branching and ascending often 5 to 6ft. Leaves ovate-lanceolate, acute, 1 to 1½ in. long, cordate at the base, the sheaths usually ciliate with long hairs. Spikes usually 3 or 4, shortly pedicellate, forming a little simple panicle of about 1 in., the rhachis and abortive pedicels glabrous. Spikelets few, rarely above 6 in., each branch or spike about 2 lines long. Outer glume acute, with about 7 equally prominent more or less muricate nerves; keel of the 2nd glume ciliate towards the top; terminal or flowering glume obtuse entire or very shortly 2-lobed, the dorsal awn proceeding quite from the base, fine and about twice as long as the spikelet.—*Patratherum echinatum*, Nees in *Edinb. New Phil. Journ.* xviii. 181; *Andropogon echinatus*, Heyne in Steud. *Syn. Glum.* i. 882.

Hab.: In southern localities.

87. APLUDA, Linn.

(From the resemblance of glumes to chaff.)

Spikelets with 1 fertile flower and a male one below it, sessile between 2 flattened pedicels, bearing each a rudimentary or barren spikelet, the whole embraced by a sheathing bract, the bracts clustered on the branches of a leafy panicle. Outer glume of the sessile spikelet concave, striate, awnless, 2nd glume acute, awnless, thin but stiff, 3rd very thin and hyaline, 4th or terminal glume very thin and hyaline, entire or bifid at the top, awnless or with a slender twisted terminal awn. Palea very thin or none. Styles distinct. Grain enclosed in the outer glumes free from them.

A small genus spread over tropical Africa and Asia, the subjoined species a common one perhaps not indigenous in Australia.

1. **A. mutica** (pointless), Linn.; *Kunth, Enum.* i. 516; *Benth. Fl. Austr.* vii. 544. Stern creeping or climbing, several feet long, with erect branching flowering shoots. Leaves long, usually glabrous. Panicles loose and leafy, 1 to 2ft. long. Bracts subtending the spikelets 3 to 4 lines long, very concave, striate, with short sometimes awn-like points, in clusters of 5 or 6. Sessile spikelet shorter than the bract; pedicellate spikelets either reduced to a rudimentary glume or more developed and protruding beyond the bract. Awns of the terminal glume very minute or scarcely deficient.—Maiden. *Ag. Gaz.* N.S.W. x.

Hab.: Recorded for Queensland by F. v. M. without locality.

88. ROTTBOELLIA, Linn. f. partly.

(After F. Rottboell.)

Spikelets in pairs in the alternate notches of the articulate rhachis of a simple spike, 1 sessile and embedded in a cavity of the rhachis, with 1 hermaphrodite flower and sometimes a male one below it, the other on a closely appressed pedicel but often spreading, with a male or rarely hermaphrodite flower, or reduced to 1 or 2 empty glumes, the spike single on each peduncle above a sheathing bract and cylindrical or nearly so. Glumes in the sessile spikelet 4, the outer one coriaceous, closely covering the cavity of the rhachis, the 2nd thinner but often rigid, concave or keeled, the 3rd and 4th and palea very thin and hyaline, all awnless. Styles distinct. Grain enclosed in the glumes but free from them.

The genus extends over tropical Asia and Africa with at least one American species. Of the four Australian ones, two have a wide range in tropical Asia, the other two are endemic.—*Benth.*

Rottboellia was originally founded by the younger Linnæus on five species which are now separated into as many genera. Brown's proposal to restrict the name to the *R. exaltata* and allied species since added has now been generally adopted.—*Benth.*

Stems scarcely branched, with single spikes of 2 to 3 in., the articles of the spike densely ciliate at the top. Sessile spikelet 1-flowered, the outer glume silky villous

1. *R. formosa*.

Stems usually branched. Peduncles solitary in the upper sheaths, with a spike of 3 to 6 in., quite glabrous. Sessile spikelet above 2 lines long, 2-flowered

2. *R. exaltata*.

Stems branched. Peduncles clustered in the upper sheaths, the spikes slender, under 3 in., glabrous. Sessile spikelet under 2 lines long, 1-flowered.

Outer glume of the sessile spikelet tuberculate at the base, the nerves scarcely winged at the top. Pedicellate spikelet barren

3. *R. muricata*.

Outer glume of the sessile spikelet smooth, the 2 nerves distinctly winged at the top. Pedicellate spikelet often fertile

4. *R. ophiuroides*.

1. ***R. formosa*** (beautiful), *R. Br. Prod.* 206; *Benth. Fl. Austr.* vii. 518. Apparently annual. Stems scarcely branched, above 1 ft. long. Leaves narrow, more or less hirsute with spreading hairs. Peduncles solitary in the upper axils, bearing each a sheathing bract and a single cylindrical spike of 2 or 3 in., not $1\frac{1}{2}$ line diameter, the rhachis exceedingly fragile and each article crowned by a ring of dense, often purplish hairs. Outer glume of the fertile spikelet broad hard and obtuse, but densely covered with appressed hairs of which the upper ones are longer giving it an acute appearance; 2nd glume broad concave and thin, 3rd and 4th smaller, very thin and hyaline, no male flower in the 3rd, the 4th alone flowering, the palea minute or deficient. Barren spikelets sessile, of a single ovate or lanceolate 3 or 5-nerved glabrous glume, with sometimes a 2nd smaller one in its axil.—Kunth, *Revis. Gram.* i. t. 91.

Hab.: Islands of Torres Strait; Port Denison.

2. ***R. exaltata*** (tall), *Linn. f. Suppl.* 114; *Benth. Fl. Austr.* vii. 518. Stems stout, erect, attaining 6 to 10 ft. Leaves long and rather broad, scabrous, the sheaths more or less hispid. Peduncles solitary in the upper sheaths. Spikes often above 6 in. long, cylindrical, 2 lines diameter when old, the upper part often slender with abortive spikelets, the rhachis and spikelets perfectly glabrous. Outer glume of the fertile spikelets ovate, rather obtuse, slightly convex, about 2 lines long, coriaceous and smooth but with many nerves more visible inside than out; 2nd glume acute, deeply immersed, 3rd and 4th thin and almost hyaline, both with perfect paleas, the 3rd with a male the 4th with a hermaphrodite flower. Pedicellate spikelets much flatter, rather smaller, with 2 male flowers or only a palea in the 3rd glume.—Kunth, *Enum.* i. 466, *R. Br. Prod.* 206; *Roxb. Corom.* Pl. t. 157.

Hab.: Gulf of Carpentaria.
Very common in tropical Asia.

3. ***R. muricata*** (muricate), *Retz*; *Kunth, Enum.* i. 467; *Benth. Fl. Austr.* vii. 514. Stems branching, 4 to 6 ft. high. Leaves rather broad, glabrous except a few cilia at the orifice of the sheaths, the margins scabrous. Spikes 1 to 2 in. long, very brittle, clustered in the upper axils on very unequal slender peduncles, with a close sheathing bract at the base of each. Spikelets about 2 lines long; outer glume of the sessile spikelet closely appressed, obtuse, slightly 2-winged at the end, coriaceous, bearing at the base a few tubercles either on each side or sometimes on the back, the spikelet containing only a single hermaphrodite flower. Pedicellate spikelet either including a male flower or reduced to empty glumes.—*R. glandulosa*, *Trin. in Mem. Acad. Petersb.* ser. 6, ii. 250; *Calorhachis muricata*, *Brongn. in Duperr. Voy. Bot.* 65, t. 14.

Hab.: Etheridge River, *Herb. F. Mueller, (Benth.)*
Also in the Malayan Peninsula and Archipelago.

4. ***R. ophiuroides*** (Ophiurus-like), *Benth. Fl. Austr.* vii. 514. A tall erect glabrous grass. Leaves long, often $\frac{1}{2}$ in. broad, the upper ones with long sheaths passing into sheathing bracts. Peduncles crowded on the short erect branches of

a large terminal leafy panicle, each branch within a sheathing bract, and a narrow sheathing bract on each peduncle. Spikes slender, simple, 2 to 3 in. long, quite glabrous and very brittle. Spikelets $1\frac{1}{2}$ to 2 lines long, both the sessile and the pedicellate ones with a hermaphrodite flower, or the pedicellate with a male flower or reduced to empty glumes. Glumes all obtuse, awnless and smooth, the outer one with the marginal nerves, and the 2nd with the keel winged at the top as in *Ischæmum*.—Bail. Ill. Mono. Gr. Q. i.; *Ischæmum rottboellioides*, R. Br. Prod. 205; *Andropogon rottboellioides*, Steud. Syn. Glum. i. 882; F. v. M. Fragm. viii. 123 (excl. syn. Retz and Brongn.)

Hab.: Gulf of Carpentaria, R. Brown; Rockingham Bay, Dallachy; Broudsound, Bowman.

39. MANISURIS, Swartz.

(Said to be from the inflorescence resembling a lizard's tail.)

Spikelets in pairs in the 1-sided notches of the articulate rhachis of a simple spike, 1 sessile and half imbedded in a cavity on the rhachis with 1 hermaphrodite flower, the other on an appressed pedicel reduced to 2 empty glumes, the spike single on the peduncle above a sheathing bract. Glumes of the sessile spikelet 4, the outer one the largest, globular and hard, covering the cavity of the rhachis, the 2nd smaller, concave, thin but rigid, 3rd and 4th small thin and hyaline. Palea none (or very minute?). Styles distinct. Grain enclosed in the hard outer glumes, free from them.

The genus is now generally reduced to the single species, widely spread over the warmer regions of the New and the Old World.

1. *M. granularis* (grain-like), Sw.; Kunth, Enum. i. 469; Benth. Fl. Austr. vii. 511. A branching leafy annual of 1 ft. or more, sprinkled or villous with spreading hairs, the leaf-sheaths usually hispid, the floral leaves generally exceeding the enclosed sheathing bracts and spikes, and the narrow sheathing bracts on the separate peduncles as long as or longer than the spikes, the whole inflorescence forming an irregular leafy panicle. Spikes mostly about $\frac{1}{2}$ in. long. Spikelets scarcely more than $\frac{1}{2}$ line diameter, the prominent grain-like hard and pitted outer glumes alone conspicuous, and appearing in a single row on one side of the rhachis.—Beauv. Agrost. t. 21, f. 10.

Hab.: Bowen.

40. HEMARTHRIA, R. Br.

(Half-jointed; referring to the spike.)

Spikelets in pairs, in the alternate notches of a simple spike, 1 sessile and half embedded in a cavity of the scarcely articulate rhachis with 1 hermaphrodite flower, the other on a closely appressed and often adnate pedicel reduced to 2 or 3 empty glumes, the spikes single on each peduncle above a sheathing bract and often flattened. Glumes in the sessile spikelet 4, the outer one appressed and covering the cavity of the rhachis, the 2nd thinner and concave or keeled, the 3rd and 4th and the palea in the 4th thin and hyaline. Styles distinct. Grain enclosed in the glumes but free from them.

A small genus of closely allied species, widely spread over the warmer regions of the globe especially on the sea-coasts of the Old World.

1. *H. compressa* (compressed), R. Br. Prod. 207; Benth. Fl. Austr. vii. 510. Stems decumbent or creeping at the base, rather rigid, ascending to 1 ft. or rather more, slightly branched. Leaves narrow, glabrous or the lower ones sprinkled with a few long hairs. Spikes solitary on the branches or nearly so, more or less compressed, rigid, 3 to 5 in. long, often $1\frac{1}{2}$ line broad. Spikelets all closely appressed, 3 to $8\frac{1}{2}$ lines long. Outer glume many-nerved, tapering into a very variable point, sometimes very short and straight especially in the sessile

spikelet, sometimes elongated and fine or minutely hooked at the extremity, or in some specimens, especially towards the end of the spike, terminating in a rather long inflexed rigid hook. In the pedicellate spikelet the point of the outer glume is often longer finer and straight, but occasionally that also is hooked and more rarely the 2nd glume ends in a small hook.—Duthie Ind. Gr. Pl. xviii.; *H. uncinata*, R. Br. l.c., Hook. f. Fl. Tasm. ii. 107; Brongn. in Duperr. Voy. Bot. t. 15.

Hab.: Brisbane River, Moreton Bay, *F. v. Mueller*, *Bailey*; Rockhampton, *O'Shanessy*; Dawson River, *F. v. Mueller*; also in *Leichhardt's* collection.

On this grass is sometimes found the fungus *Puccinia straminis*, *De Bary*.

41. OPHIURUS, Br.

(Snake-tailed; resemblance of the spikes.)

Spikelets singly sessile and embeded in the alternate cavities of the articulate rhachis of a simple spike, with 1 hermaphrodite or female flower and often a male one below it, the spike single on each peduncle above a sheathing bract, and cylindrical or nearly so. Glumes 4, the outer one hard, closely covering the cavity of the rhachis, the 2nd thin but rather rigid, concave or keeled, the 3rd and 4th as well as the palea thin and hyaline, all awnless. Styles distinct. Grain enclosed in the glumes but free from them.

A small tropical Asiatic and African genus, the only Australian species extending also into East India. The genus only differs from *Rottboellia* in the want of the pedicellate barren spikelets.—*Benth.*

1. *O. corymbosus* (corymböse), *Gartn.*; *Kunth*, *Enum.* i. 464; *Benth. Fl. Austr.* vii. 512. Stems erect, branching, attaining 5 or 6ft. in height. Upper leaves few with long sheaths, quite glabrous in the typical form. Spikes rigid, 2 to 5in. long and scarcely above 1 line diameter, pedunculate and clustered in the upper leaf-sheaths, but each peduncle with a long narrow sheathing bract below the spike. Outer glume lanceolate, 2 lines long, very hard, 5-nerved and pitted or tuberculate between the nerves, 2nd glume in the deep cavity very concave and keeled, 3rd enclosing a palea and male flower, 4th or terminal one with a hermaphrodite (or female?) flower.—*Rottboellia corymbosa*, *Linn.*; *Roxb. Corom.* Pl. t. 181.

Hab.: Albert River, *F. v. Mueller*; Endeavour River, *Banks and Solander*; Kennedy district, *Daintree*; Rockhampton, *O'Shanessy*, *Thozet*; Herbert's Creek, *Bowman*.

Widely spread over East India, also in tropical Africa.

42. ELIONURUS, Willd.

(Twisted tails.)

Spikelets in pairs, in the alternate notches of the articulate rhachis of a simple spike, 1 sessile with 1 hermaphrodite flower, the other pedicellate and barren, the spike solitary and densely silky-hairy. Outer glume of the barren spikelet usually spreading. Fertile spikelet appressed. Glumes 4, the outer one the largest erect and 2-lobed, the 2nd shorter, thin but rigid and pointed, 3rd and 4th shorter very thin and hyaline, all without awns. Palea none (or very minute?). Styles distinct. Grain enclosed in the outer glumes, free from them.

The genus is spread over tropical and subtropical America and Africa, extending sparingly into Western Asia. The only Australian species is endemic.

1. *E. citreus* (Citron-like scent), *Munro*; *Benth. Fl. Austr.* vii. 510. Stems slender, $1\frac{1}{2}$ to 2ft. high. Lower leaves very narrow, almost subulate, with short broad sheaths; upper ones with long loose sheaths passing into the sheathing bracts, upper one on the peduncle below the spike. Spike 8in. long, densely silky with the spreading hairs of the rhachis and pedicels, Barren spikelets on a short

broad pedicel, the outer glume narrow, very acute, spreading, fringed with long cilia, the 2nd erect rather shorter, the prominent keel produced into a fine point, the 3rd small and hyaline; no flower. Sessile spikelet erect and appressed, much flattened, 5 to 6 lines long. Outer glume lanceolate, 7-nerved, the 2 lateral nerves thickened ciliate and produced into long erect ciliate lobes or thick points, 2nd glume $\frac{1}{2}$ as long, finely pointed.—*Andropogon citreus*, R. Br. Prod. 203.

Hab.: Northumberland Islands, R. Brown. Common along the rivers in tropical localities.

43. HETEROPOGON, Pers.

(Variable beard.)

Spikelets 1-flowered, monœcious, in pairs in the notches of the articulate rachis of a simple 1-sided spike, the females sessile, cylindrical, turned to one side of the spike, the males lanceolate, awnless, shortly pedicellate, imbricate on the other side of the spike. Glumes in the female spikelet 4, the outer one hard convolute, the 2nd keeled, the 3rd very thin and hyaline, 4th or terminal glume a hard twisted and bent awn, attenuate and flexuose or narrow and hyaline at the base as in *Andropogon*. Paleas very small and thin or none. Styles distinct. Grain enclosed in the hardened glumes but free from them.

A genus of several species, chiefly tropical, in the New as well as the Old World. Both the Australian species extend into tropical Asia, and one over the general area of the genus.—*Benth.*

Spikes about 2in. long; male spikelets 3 to 4 lines 1. *H. contortus*.
Spikes 3 to 6in. long; male spikelets $\frac{3}{4}$ in. , 2. *H. insignis*.

1. *H. contortus* (twisted), *Roem. et Schult. Syst.* ii. 386; *Benth. Fl. Austr.* vii. 517. Bunch Spear-grass. Stems ascending or erect, 1 to 2ft. high. Leaves narrow, ciliate with a few long hairs, the sheaths flattened. Spikes pedunculate, 1 to 2in. long without the awns. Male or barren spikelets 3 to 4 lines long, green, ciliate, closely imbricate in 2 rows along one side of the spike almost concealing the females. Female spikelets narrow, the outer glume hard, obtuse, convolute, the 2nd narrow with a hard centre, the hairs surrounding the spikelet brown and silky. Awn protruding often to 2in. and very much twisted.—*Duthie Ind. Gr. Pl.* xix.; *Andropogon contortus*, Linn.; Kunth, Enum. i. 486; R. Br. Prod. 201; F. v. M. Fragm. viii. 120; *Heteropogon hirtus*, Pers. Syn. ii. 533; *Andropogon striatus*, R. Br. Prod. 201.

Hab.: Sweers Island, *Henne*; Keppel Bay, R. Brown; Endeavour River, *Banks and Solander*; North-east coast, A. Cunningham; Rockingham Bay, *Dallachy*; Moreton Bay, F. v. Mueller, *Bailey*, *Leichhardt*; Rockhampton, O'Shanesy; Springsure, *Wuth*.

The fungus *Cerebella andropogonis*, *Cess.* is at times met with on the inflorescence of this grass.

2. *H. insignis* (remarkable), *Thw. Enum. Ceyl. Pl.* 437; *Benth. Fl. Austr.* vii. 517. A much more robust plant than *H. contortus*, attaining from 8 to 10ft. Leaves narrow, with flattened sheaths, glabrous or rarely sprinkled with long loose hairs. Spikes 3 to 6in. long without the awns. Lower male or barren spikelets lanceolate, acute, about $\frac{1}{2}$ in. long, the upper ones more acuminate and contracted at the base, often $\frac{3}{4}$ in. long. Outer glume glabrous, the 2nd with inflexed hyaline ciliate margins. Female spikelets 3 to 4 lines long, brown and pubescent on a short villous brown pedicel. Outer glume obtuse, the midrib thick and prominent, with a furrow on each side. Awn 3, 4 or even 5in. long.—*Andropogon triticeus*, R. Br. Prod. 201; F. v. M. Fragm. viii. 120.

Hab.: Islands of the Gulf of Carpentaria, R. Brown; Bountiful Island, *Henne*; Lord Howick's group, F. v. Mueller; Rockingham Bay, *Dallachy*; Rockhampton, *Bowman*, *Thozet*, O'Shanesy.

Also in Timor and Ceylon.

44. ANDROPOGON, Linn.

(Tuft of hairs on flowers supposed to resemble a man's beard.)

(Gymnandropogon, Cymbopogon and Schizachyrium, Nees).

Spikelets 1-flowered or empty, in pairs in the alternate notches of the articulate rhachis of simple spikes, 1 sessile hermaphrodite (or rarely female?) and fertile the other pedicellate and barren either male or empty, the spikes either solitary or clustered and sessile or very shortly pedunculate at the end of the common peduncle. Glumes in the fertile spikelet 4, the outer one the largest, awnless, several-nerved, but often 2 nerves near the margin much more prominent than the others; 2nd glume keeled, rarely produced into a short straight awn, 3rd much smaller, very thin and hyaline, always empty, 4th or terminal glume under the flower very slender flexuose and stipes-like at the base or if dilated very thin and hyaline, entire or bifid at the top, with an awn either terminal or from the notch, rigid and twisted in the lower part, bent back and very fine above the middle. Palea small and hyaline or none. Glumes of the barren spikelets 4 or fewer, the outer one the largest and many-nerved, the 2nd keeled, the 3rd and 4th when present small thin and hyaline, all awnless. Styles distinct. Grain enclosed in the glumes but free from them.—Grasses usually tall and often scented. simple or paniculately branched.

A large genus, generally spread over the warmer regions of the globe, with a few extratropical species both in the northern and southern hemispheres.

SECTION I. **Gymnandropogon**.—Spikes 2, 3 or more, clustered at the end of a peduncle without sheathing bracts, very rarely reduced to a single spike.

Spikelets concealed or nearly so under copious long silky hairs.

Spikes about 3 in., spikelets about 3 lines long 1. *A. erianthoides*.

Spikes not above 2 in., spikelets scarcely 2 line long.

Long silky hairs on the back of the outer glumes as well as on the rhachis and pedicels 2. *A. sericeus*.

Long silky hairs only or chiefly on the rhachis and pedicels.

Glumes not pitted 3. *A. affinis*.

Outer glumes marked with a pit on the back 4. *A. pertusus*.

Spikes silky-hairy, but the hairs not covering the spikelets.

Spikes 3 or 4 in a close cluster. Outer glumes obtuse or toothed 5. *A. annulatus*.

Spikes numerous, the common axis elongated 6. *A. intermedius*.

SECTION II. **Cymbopogon**.—Spikes 2 together on each peduncle within or above a sheathing bract.

Spikes both sessile at the end of the peduncle. Awns slender short and glabrous or deficient.

Silky hairs long, concealing the spikelets or nearly so.

Spikes erect. Awns prominent.

Leaves long and broad. Stems tall and stout 7. *A. procerus*.

Leaves wholly subulate or very narrow, tapering into long subulate points. Spikelets small 8. *A. exaltatus*.

Leaves flat, narrow. Spikes densely woolly 9. *A. lanatus*.

Spikes at length spreading or reflexed. Awns none or very fine and scarcely projecting 10. *A. bombycinus*.

Hairs much shorter than the spikelets. Spikes divaricate usually shortly awned 11. *A. Nardus*.

Hairs minute. Spikes soon reflexed. Awns very short or none 12. *A. refractus*.

One spike affixed lower down than the other, slightly hairy. Awns 1 to 3 in. long, hairy in the lower part 13. *A. filipendulus*.

SECTION III. **Schizachyrium**.—Peduncles axillary or terminal, bearing each a single spike above a narrow sheathing bract.

Rhachis and pedicels shortly ciliate, a small oblique bract at each notch 14. *A. fragilis*.

Among the following species those with densely silky-hairy spikes approach *Pollinia* in habit, but the pedicellate spikelet is always barren and awnless, and most frequently without even a male flower.—*Benth*.

1. ***A. erianthoides*** (*Erianthus*-like). *F. v. M. Fragm.* x. 75; *Benth. Fl. Austr.* vii. 529. Satin Top. An erect glaucous grass of 2 to 5 ft., glabrous except the inflorescence, the nodes not bearded. Leaves rather narrow. Spikes usually 8

or 4, nearly sessile at the end of a peduncle without sheathing bracts, erect or scarcely spreading, about 8 in. long, the spikelets concealed under the very copious long silky hairs surrounding the sessile spikelets on the pedicels and a few on the outer glumes. Sessile spikelets about 8 lines long, the outer glume nearly equally many-nerved, with a short scarious often notched tip; 2nd glume rather shorter, keeled, 8-nerved, acute, 3rd thin and hyaline; awn or terminal glume fine, not above twice the length of the spikelet, contracted at the base into a flexuose stipes, with sometimes a very slight hyaline dilatation. Pedicellate spikelet reduced to 1 or 2 empty glumes.—Bail. Ill. Mono. Gr. Q. i.: Turner Ag. Gaz. N.S.W. ii. Pl.

Hab.: Peak Downs, *F. v. Mueller*; Darling Downs, *Leichhardt*; Springsure, *Wuth.*

2. *A. sericeus* (silky), *R. Br. Prod.* 201; *Benth. Fl. Austr.* vii. 529. Blue Grass. Stems erect, branching at the base, usually rather slender and 1 to 2 ft. high, with narrow leaves chiefly at the base, but sometimes twice that height with larger leaves, the nodes bearded. Spikes in the typical form 2 or 3 or rarely twice as many, sessile at the top of a slender peduncle without sheathing bracts, all 1 to 2 in. long and densely clothed with long silky hairs on the outer glumes as well as on the rachis and pedicels. Spikelets scarcely 2 lines long, the pedicellate one reduced to a many-nerved silky-hairy glume enclosing a second small hyaline lanceolate one. Outer glume of the sessile spikelet rather rigid, obtuse or nearly so, about 5-nerved, with long silky hairs on the back and a short scarious ciliate tip; 2nd glume keeled, acute, glabrous; 3rd very small broad thin and hyaline; awn or terminal glume $\frac{3}{4}$ to 1 $\frac{1}{2}$ in. long, without any hyaline dilatation at the base.—Bail. Ill. Mono. Gr. Q. i.; Turner Ag. Gaz. N.S.W. i. Pl.; *A. chrysatherus*, *F. v. M.* in *Linnæa*, xxv. 448; *A. annulatus*, *F. v. M.* *Fragm.* viii. 128, but not of *Forsk.*

Hab.: Keppel Bay, *R. Brown*; Cape York, *Daemel*; Port Curtis, *M'Gillivray*; Moreton Bay, *A. Cunningham*, *F. v. Mueller* and others; Condamine River, etc., *Leichhardt*; Rockhampton, and other localities in the south, *O'Shanesy* and others.

Also in New Caledonia and the Philippines.

Var. *polystachyus*. Tassel Blue Grass. Usually a larger plant with 10 to 30 or even more spikes of 1 $\frac{1}{2}$ to 2 in., all closely sessile in a terminal head, the long silky hairs and structure of the spikelets precisely as in the typical form.

Hab.: Sweers Island, *Henne*, and many tropical localities; Port Denison, *Fitzalan*; Burdekin River, *Bowman*; Rockhampton, *O'Shanesy*.

3. *A. affinis* (near another), *R. Br. Prod.* 201; *Benth. Fl. Austr.* vii. 580. Very near *A. sericeus* and perhaps a variety, with the same habit, the nodes less bearded and sometimes quite glabrous. Spikes usually 3 or 4 not quite sessile, 1 $\frac{1}{2}$ to 2 in. long, the spikelets rather longer and narrower than in *A. sericeus* and not so closely imbricate, the long silky spreading hairs only on the pedicels and at the base of the sessile spikelets, not on the backs of the glumes, the 3rd glume more developed; the awn $\frac{3}{4}$ to 1 $\frac{1}{2}$ in. long.—Turner Ag. Gaz. N.S.W., ii. Pl.

Hab.: Keppel Bay, *R. Brown*; Moreton Bay, *Leichhardt*, *C. Stuart*, *Bailey*.

4. *A. pertusus* (pitted), *Willd.*; *Kunth. Enum.* i. 498; *Benth. Fl. Austr.* vii. 580. Stems slender, 1 to 2 ft. high, the nodes glabrous. Leaves chiefly at the base of the stem, narrow, glabrous. Spikes 2 to 5, sessile, or nearly so at the end of the peduncle without sheathing bracts, 1 to 2 in. long, silky-hairy as in the preceding species, with long hairs on the pedicels and at the base of the sessile spikelets. Spikelets fully 2 lines long, rather obtuse, the outer glume marked above the middle with a small pit which assumes inside the appearance of a projecting gland. Awn slender, about $\frac{3}{4}$ rarely 1 in. long. Pedicellate spikelet usually containing a male flower.—*R. Br. Prod.* 201; *Duthie Ind. Gr. Pl.* xxv.

Hab.: East Coast, *R. Brown*; Dawson River, *F. v. Mueller*; Brisbane River, *Bailey*; Rockhampton, *Thozet*, *O'Shanesy*; Darling Downs.

Widely spread over tropical Asia.

5. **A. annulatus** (ringed), *Forsk.*; *Kunth, Enum.* i. 498; *Benth. Fl. Austr.* vii. 531. Stems from a tufted base ascending to about 2ft., the nodes glabrous or slightly bearded. Leaves narrow, usually glaucous. Spikes 2 or 3, nearly sessile at the end of the peduncle without sheathing bracts, $1\frac{1}{2}$ to 2in. long, the pedicels and base of the sessile spikelets much less ciliate than in the preceding species. Spikelets about 2 lines long. Outer glume of the sessile one membranous, prominently many-nerved, obtuse or 3-toothed, ciliate on the margin and with a few long hairs on the back at the top; 2nd glume thin, the midrib alone prominent, 3rd very thin and hyaline; awn or terminal glume $\frac{1}{2}$ to $\frac{3}{4}$ in. long, without any hyaline dilatation at the base. Pedicellate spikelet nearly similar but awnless, and with a male flower or reduced to empty glumes.—Duthie Ind. Gr. Pl. xx.

Hab.: Ipswich and other southern localities; Rockhampton.

Widely spread over tropical Asia and Africa.

Var. *monostachya*. Spike single. Sessile spikelets rather longer than in the typical form, the outer glume with fewer nerves and much more ciliate with long hairs.

Hab.: Nerook Creek, *Bowman*.

6. **A. intermedius** (intermediate), *R. Br. Prod.* 202; *Benth. Fl. Austr.* vii. 531. An erect grass of 2ft. or more, branching and leafy at the base, the nodes varying with or without beards. Leaves narrow. Spikes slender, 1 to $1\frac{1}{2}$ in. long, usually numerous, all shortly pedicellate in an oblong terminal panicle of 8 or 4in. without sheathing bracts, the common rachis glabrous and always more or less elongated, the pedicels and base of the sessile spikelets more or less ciliate. Spikelets under 2 lines long, narrow and acute or scarcely obtuse and often purplish. Outer glume often, but not always even in the same spike, marked with a dorsal pit as in *A. pertusus*. Awn small and slender. Pedicellate spikelet developed and often enclosing a male flower.—*A. inundatus*, *F. v. M.* in *Linnæa*, xxv. 444.

Hab.: Keppel Bay, *R. Brown*; Port Denison, *Fitzalan*; Brisbane River, Moreton Bay, *F. v. Mueller, Bailey*; Rockhampton and numerous localities in the south, *Thozet, Bowman* and others.

7. **A. procerus** (very tall), *R. Br. Prod.* 202; *Benth. Fl. Austr.* vii. 532. Stems stout, erect, 3 to 5ft. high or even more. Leaves long, the lower ones $\frac{1}{2}$ to $\frac{3}{4}$ in. broad with long sheaths, all glabrous, the ligula broad and jagged. Panicle 6in. to above 1ft. long, narrow, dense, with very numerous short branches, the linear acuminate erect sheathing bracts mostly longer than the spikes. Peduncles short, erect with a sheathing bract about the middle and 2 erect spikes rarely $\frac{3}{4}$ in. long, the long white hairs concealing the spikelets. Sessile spikelets usually 3, narrow, scarcely 2 lines long; outer glume flattened on the back with 2 prominent nerves not far from the margin and usually 3 fainter ones between them; the 2nd glume narrow, keeled and pointed, 3rd short, very thin and hyaline; awn or terminal glume usually above $\frac{1}{2}$ in. long with a narrow bifid hyaline base. Outer glume of the barren pedicellate spikelets many-nerved.

Hab.: Groote Islands, *R. Brown*.

This and the two following species are certainly very closely allied, but the differences chiefly in foliage appear to be constant. *A. procerus* is also remarkable for its smaller spikelets, *A. lanatus* for the denser wool of the spikes, all three differ from *A. bombycinus* in their erect spikes and much longer awns.—*Benth.*

8. **A. exaltatus** (tall), *R. Br. Prod.* 202; *Benth. Fl. Austr.* vii. 532. Stems erect, scarcely 1ft. high to above 3ft. Leaves very narrow, all ending in long subulate points and in the smaller specimens subulate from the sheath, the ligula long and scarious. Nodes usually glabrous. Panicle sometimes short and dense, sometimes long and interrupted. Spikes 2 or very rarely 3 together, $\frac{1}{2}$ to 1in. long, erect, densely hairy, the common peduncles short with a sheathing bract as in the

allied species. Spikelets $2\frac{1}{2}$ to 3 lines long, the 2 prominent nerves of the outer glume almost winged, with 3 to 5 less conspicuous nerves between them. Awns $\frac{1}{2}$ to 1 in. long.—Hook. Ic. Pl., 1869.

Hab.: Thursday Island.

9. **A. lanatus** (woolly), *R. Br. Prod.* 202; *Benth. Fl. Austr.* vii. 533. An erect grass of 2 or 3 ft. or more, with the habit inflorescence and erect spikes of *A. exaltatus*, but the leaves, though narrow usually flat, and the spikes very densely woolly-hairy almost as in *A. bombycinus*. Awns $\frac{1}{2}$ to 1 in. long.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*; Albany, *F. v. Mueller*; Rockingham Bay, *Dallachy*; Mount Wheeler, *Thozet*.

10. **A. bombycinus** (inflorescence resembles masses of silk), *R. Br. Prod.* 202; *Benth. Fl. Austr.* vii. 533. An erect rigid perennial grass of $1\frac{1}{2}$ to 3 ft., usually glabrous except a little silky pubescence on the lower leaf-sheaths, the nodes glabrous or shortly bearded. Leaves narrow, flat, rather rigid, the ligula very prominent, entire. Panicle shortly branched, 3 to 6 in. long, with sheathing bracts of 1 to 2 in. under the branches. Peduncles usually shorter than the bracts, bearing each a narrow sheathing bract and 2 very densely woolly-hairy spikes of $\frac{1}{2}$ to 1 in., at first erect but soon spreading or reflexed. Sessile spikelets 2 to 5, concealed by the silvery-silky hairs. Outer glumes acute, many-nerved but the 2 lateral nerves much more prominent, especially as the flowering advances and the intermediate ones becoming almost obliterated or visible only towards the end of the glume; 2nd glume thin, with a prominent keel produced into a short point, 3rd very thin, faintly 3-nerved; terminal flowering glume very thin and hyaline, shortly bifid, with a very fine awn scarcely exceeding the spikelet, or entire without any awn. Pedicellate spikelets reduced to a single narrow many-nerved glume of $2\frac{1}{2}$ to 3 lines.—Bail. Ill. Mono. Gr. Q. i.

Hab.: Broadsound, *R. Brown*; Peak Downs, *Burkitt*; Condamine River, *Leichhardt*; Spring-sure, *Wuth*.

The densely silky-woolly spreading spikes and very short awn, readily distinguish this from the three preceding species.

11. **A. Nardus** (Nardus-like), *var. grandis*, *Hack. DC. Mono. Phanero.* vii. 605. Stems erect, not very stout, 2 to 5 ft. high. Leaves narrow, flat, glabrous, the ligula prominent and scarious. Panicle varying from short and dense to 1 or $1\frac{1}{2}$ ft. long and loose but narrow, the lanceolate sheathing acute bracts under each branch mostly exceeding the spikes. Peduncles solitary within the last bract, each bearing a narrow sheathing bract and 2 sessile spikes, at first erect at length spreading, $\frac{1}{2}$ to $\frac{3}{4}$ in. long, the rhachis and pedicels hairy, but the hairs short not covering the spikelets as in the preceding species. Sessile spikelets 3 to 5, about $2\frac{1}{2}$ lines long; outer glume about 5-nerved, the 2 lateral nerves very prominent towards the end; 2nd glume thin, rigid, slightly keeled, with hyaline ciliate margins, 3rd very thin, hyaline and ciliate; terminal or flowering glume very narrow, hyaline, bifid, with a fine awn about twice as long as the spikelet. Pedicellate spikelet reduced to empty glumes, the outer one many-nerved.—*A. schœnanthus*, *var. Martini*, *Benth. in Fl. Austr.* vii. 534; *Bent. and Trim. Med. Pl. t.* 297.

Hab.: Herbert's Creek, *Bowman*; Rockhampton, *O'Shanesy*.
Widely spread over tropical Asia.

12. **A. refractus** (broken), *R. Br. Prod.* 202; *Benth. Fl. Austr.* vii. 534. A glabrous erect grass of about 3 ft., with the narrow leaves paniculate inflorescence and sheathing bracts of the preceding species, and the spikes similarly 2 together about $\frac{1}{2}$ in. long on short bracteate peduncles, but much more divaricate, soon reflexed, and glabrous except a small tuft of short hairs at the base of the sessile spikelets. Sessile spikelets 2 to 5, $2\frac{1}{2}$ to 3 lines long; outer glume acute,,

many-nerved; 2nd narrow and keeled, 3rd thin and hyaline; terminal or flowering glume hyaline, narrow, either 2-lobed with an awn slightly exceeding the spikelet, or more frequently entire or nearly so and awnless. Pedicellate spikelets neuter or rarely with a male flower, the outer glume many-nerved.—Sieb. *Agrostogr.* n. 54; Bail. III. *Mono. Gr. Q.* ii.; Turner *Ag. Gaz. N.S.W.* ii. Pl.

Hab.: Brisbane River, Moreton Bay, *C. Stuart, Bailey*; Wide Bay, *Bidwill*; Rockhampton, *O'Shanesy*; Herbert's Creek, *Bowman*; Warwick, *Beckler*.

18. **A. filipendulus** (drooping threads), *Hack, in Fl.* xxix. 115; *Hook. in Fl. Brit. Ind.* vii. 203. Stems rather slender, erect, about 2ft. high. Leaves narrow, glabrous or sprinkled with long hairs. Nodes not bearded. Panicle looser than in the preceding species with slender but not very long branches solitary or clustered within sheathing bracts or floral leaves. Peduncles exceeding the last sheathing bracts bearing each 2 spikes but not digitate, one attached lower down than the other, each $\frac{1}{2}$ to $\frac{3}{4}$ in. long without the awns. Sessile spikelets 3 or 4, the lowest sometimes containing only a male flower, the others with a hermaphrodite flower, 2 to $2\frac{1}{2}$ lines long, slightly hairy. Outer glume obtuse, about 9-nerved, 2nd rather shorter, obtuse, 3-nerved, 3rd very narrow, thin and hyaline; awn or terminal glume on a short filiform base, 1 to 2 in. long, the lower part rigid and hirsute with rufous hairs. Pedicellate spikelets narrow, acute, $2\frac{1}{2}$ to 3 lines long, usually containing a male flower, the outer glume many-nerved, often produced into a fine point.—*A. procerus*, F. v. M. *Fragm.* viii. 121, not of R. Brown; *A. lachnatherus*, Benth. *Fl. Austr.* vii. 534.

Hab.: Islands of Moreton Bay, *F. v. Mueller*; Brisbane River, *Bailey*; Rockhampton, *O'Shanesy*; Nerkool Creek, *Bowman*.

14. **A. fragilis** (fragile), *R. Br. Prod.* 202; *Benth. Fl. Austr.* vii. 535. A slender decumbent much-branched grass, attaining sometimes 2ft. or more, usually glabrous. Leaves narrow, rather short, the upper ones passing into sheathing bracts. Panicle leafy, slender, secund, consisting of few spikes on very unequal slender peduncles, each with a narrow acute sheathing bract below the spike. Spike slender, 1 to $1\frac{1}{2}$ in. long, with a short hyaline, obscurely cup-shaped bract enclosing each notch. Sessile spikelets about 2 lines long, very narrow; outer glume rigid but thin, faintly-nerved, the 2 lateral nerves more prominent, 2nd glume keeled, acute, 3rd very thin and hyaline; terminal glume thin and hyaline, divided almost to the base into 2 narrow lobes, the awn between them shortly exserted. Pedicellate spikelets reduced to a single narrow empty glume, tapering into a fine awn, or sometimes in the terminal spikelets acute only.

Hab.: Endeavour River, *Banks and Solander*, and other tropical localities.

45. CHRYSOPOGON, Trin.

(Hairs under the spikelet often of a golden colour.)

(*Holcus*, *R. Br.* partly.)

Fertile spikelets 1-flowered, sessile between 2 pedicellate male or barren spikelets at the end of the filiform unequal simple or divided branches of a terminal panicle, with sometimes 1 to 3 pairs of spikelets on the branch below the terminal 8. Glumes of the fertile spikelets 4, the outer one the largest, awnless, membranous and many-nerved, or more rigid with the lateral nerves prominent and often muricate; 2nd glume narrow, keeled, pointed or produced into a fine straight awn; 3rd much smaller, very thin and hyaline; 4th or terminal glume under the flower slender, flexuose and stipes-like at the base, or dilated hyaline and 2-lobed, with a short or long awn terminal or from between the lobes, twisted in the lower half and bent back above the middle as in *Andropogon*.

Palea very small or none. **Styles** distinct. **Grain** enclosed in the glumes, but free from them. **Pedicellate spikelets** awnless, with reduced glumes and usually 1 male flower.

The genus extends over the tropical and temperate regions of the New as well as the Old World.

Spikelets 3 to 5 lines long, 1 fertile and 2 pedicellate ones to each branch, 2nd glume of the fertile one awned. Awn of the terminal one long and rigid . . . 1. *C. Gryllus*.
Spikelets scarcely $1\frac{1}{2}$ line long, 1 to 3 fertile besides the pedicellate ones on each branch, 2nd glume awnless . . . 2. *C. parviflorus*.
Spikelets $2\frac{1}{2}$ to 3 lines long, 3 to 5 fertile besides the pedicellate ones on each branch. Panicle narrow, usually compact.
Panicle 3 to 4 in. long, 2nd glume of the fertile spikelet acute awnless . . . 3. *C. aciculatus*.
Panicle 4 to 10 in. long, 2nd glume of the fertile spikelet shortly awned . . . 4. *C. elongatus*.

1. **C. Gryllus** (a cricket), *Trin. Fund. Arost.* 188, and in *Mem. Acad. Petersb. ser. 6, ii.* 817; *Benth. Fl. Austr.* vii. 537. An erect glabrous grass of 2 to 4 ft. Leaves long and narrow, with a small ligula. Panicle loose and spreading, 8 to 6 in. long, of numerous capillary simple branches, mostly verticillate, of very unequal length, each bearing a single hermaphrodite spikelet sessile between 2 pedicellate male ones with a tuft of hairs at the base of the sessile one and on the pedicels. Sessile spikelet narrow, 8 to 4 lines long; outer glumes rigid, acute, 5 or 7-nerved, the lateral nerves more prominent and muricate or hispid, with a few short conical or rigid hairs, 2nd glume narrow, hispid only at the end, the keel produced into a fine straight awn, 3rd thin and hyaline; awn or terminal glume long rigid and twisted in the lower part, the hyaline base narrow with short lobes sometimes obsolete. Pedicellate spikelets 8 to 5 lines long, the outer glume membranous tapering into a short fine awn, the inner one unawned.—*Maiden Ag. Gaz. N.S.W.*, xi. Pl.; *Andropogon Gryllus*, Linn.; Kunth. i. 504; *Sibth. Fl. Græc. t.* 67; *F. v. M. Fragm.* viii. 121; *Holcus Gryllus*, R. Br. *Prod.* 199.

Hab.: Gulf of Carpentaria, *Landsborough, Gulliver*; Keppel Bay, *R. Brown*; Port Denison, *Fitzalan, Dallachy*; Peak Downs, *Burkitt*; Rockhampton, *O'Shanesy*; common in the south.

Widely spread over the tropical and warmer temperate regions of the Old World.

Var. pallidus. Spikelets rather larger with longer stouter awns.—*Holcus pallidus*, R. Br. *Prod.* 199; *Pollinia pallida*, Roem. et Schult. *Syst.* ii. 829; *Andropogon pallidus*, Kunth, *Enum.* i. 505.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*.

2. **C. parviflorus** (flowers small), *Benth. Fl. Austr.* vii. 537. Scented Golden Beard. Stems 2 to 5 ft. high, the nodes usually but not always bearded. Leaves narrow, scabrous, glabrous or the lower sheaths pubescent or hairy. Panicle 4 to 8 in. long, with very numerous capillary branches mostly clustered and divided, the ultimate branches bearing in the typical form each a single hermaphrodite spikelet between 2 pedicellate male ones, the pedicels and base of the sessile spikelet ciliate. Spikelets scarcely $1\frac{1}{2}$ line long. Outer glume acute, not awned, finely many-nerved. Awn capillary, 3 to 6 lines long, without any basal dilatation.—*Maid. Gr. N.S.W.* 85; *Holcus parviflorus*, R. Br. *Prod.* 199; *Andropogon micranthus*, Kunth, *Enum.* i. 504; *Anatherum parviflorum*, Spreng. *Syst.* i. 290; *Sorghum parviflorum*, Beauv. *Agrost.* 182; *Holcus cærulescens*, Gaudich. in Freyc. *Voy. Bot.* 411, t. 27; *Andropogon violascens*, Nees in Sieb. *Agrostoth. n.* 65, Steud. *Syn. Glum.* i. 396; *Chrysopogon violascens*, Trin. in *Mem. Acad. Petersb. ser. 6, ii.* 319; *Andropogon montanus*, Roxb.; Kunth, *Enum.* i. 506; *F. v. M. Fragm.* viii. 122; *Chrysopogon montanus*, Trin. in Spreng. *Neu. Entd.* ii. 98, and in *Mem. Acad. Petersb. ser. 6, ii.* 817.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*; Keppel Bay, *R. Brown*; Port Curtis, *McGillivray*; Brisbane River, Moreton Bay, *F. v. Mueller, Leichhardt*; Rockhampton, *O'Shanesy*; Herbert's Creek, *Bowman*; Darling Downs, *Wuth*; Peak Downs, *Lav.*

Var. flavescens. This only differs in the colour of the inflorescence, the usual form being dark, somewhat purplish, while this is of a lovely pale-yellow colour.

Hab.: Found on the Darling Downs.

Var. *spicigera*. Ultimate branches of the panicle bearing one or two sessile spikelets below the terminal one, each accompanied by a pedicellate male.

Hab.: Port Denison, *Fitzalan*; Brisbane River, *Bailey*, *Prentice*.

The species and the varieties are easily known by the peculiar fragrance of the panicle on being rubbed.

The species appears to be generally dispersed in East India and in New Caledonia.

3. *C. aciculatus* (needle-like), *Trin. Fund. Agrost.* 188 and in *Mem. Acad. Petersb. ser. 6, ii: 317*; *Benth. Fl. Austr.* vii. 588. Stems from a shortly creeping or decumbent root, branching, erect, about 1 ft. high, with few long leaf-sheaths and short laminae, lower leaves rather rigid and erect. Panicle narrow, compact, 3 to 4 in. long, with numerous unequal filiform branches, each with 2 to 4 sessile hermaphrodite spikelets accompanied by pedicellate males, the pedicels not ciliate. Spikelets narrow, $2\frac{1}{2}$ to 3 lines long. Outer glume of the sessile spikelets with 2 muricate nerves, and the keel of the 2nd usually ciliate. Awn short and fine with a very slight basal dilatation.

Hab.: Mulgrave and Johnstone Rivers.

4. *C. elongatus* (elongated), *Benth. Fl. Austr.* vii. 588. An erect glabrous grass, branching at the base and attaining 3 or 4 ft. or even more, with long narrow leaves. Panicle in the typical form erect, narrow, dense, 6 to 10 in. long with very numerous capillary unequal clustered branches, each bearing 3 to 5 or rarely only 1 or 2 hermaphrodite spikelets sessile between 2 pedicellate male ones, the triplets sessile or very shortly pedicellate with a tuft of hairs under each fertile spikelet. Spikelets all narrow, acute, about 3 lines long. Outer glume of the fertile spikelet rigid, with 2 prominent lateral nerves more or less muricate, the intermediate nerves often very faint, 2nd glume narrow, with a muricate or shortly ciliate keel produced into a fine point or short awn, 3rd lanceolate, very thin and hyaline, often ciliate; awn very fine, $\frac{1}{4}$ to $\frac{1}{2}$ in. long, with a narrow hyaline shortly 2-lobed base. — *Holcus elongatus*, R. Br. *Prod.* 200; *Andropogon elongatus*, Spreng. *Syst.* i. 287; F. v. M. *Fragm.* viii. 121.

Hab.: Coen River, *R. Br.*; Sweers Island, *Henne*; Cape York, *Daemel*.

Var. *filipes*. Leaves narrower, panicle looser with longer filiform branches and the whole panicle often shorter, the awns rather longer.

Hab.: Endeavour River, *A. Cunningham*; Rockingham Bay, *Dallachy*; Balonne River, *Mitchell*; Rockhampton, *O'Shanesy*.

46. SORGHUM, Pers.

(From the Indian name.)

(*Holcus*, R. Br. partly.)

Fertile spikelet 1-flowered, sessile between 2 pedicellate male or barren ones, at the end of the simple or divided branches of a terminal panicle, with 1 to 5 pairs or triplets of spikelets below the terminal 3. Glumes on the fertile spikelets 4, the outer one the largest, awnless, lanceolate or broad, hard and shining, obscurely nerved, 2nd glume rather hard keeled and acute, 3rd glume shorter, very thin and hyaline, 4th or terminal glume very thin, hyaline and 2-lobed at the base, with an awn between the lobes twisted in the lower half bent above the middle as in *Andropogon*. Palea very small or none. Styles distinct. Grain enclosed in the hard and shining outer glumes, free from them.

The genus extends over the tropical and warm temperate regions of the New and the Old World.

Nodes glabrous or scarcely pubescent. Fruiting spikelets lanceolate, nearly glabrous. Awn short and fine.

Nodes bearded. Fruiting spikelets lanceolate, $2\frac{1}{2}$ to 4 lines long, villous.

Awn usually long. Ovary glabrous

Nodes bearded. Fruiting spikelets ovoid, 2 lines long, sometimes with a short conical apex, villous. Awn not very long. Ovary glabrous

Nodes nearly glabrous. Fruiting spikelets scarcely 2 lines long, villous.

Awn over lin. long

1. *S. *halepense*.

2. *S. plumosum*.

3. *S. fulvum*.

4. *S. laxiflorum*

1. **S. *halepense** (of Aleppo), *Pers. Syn.* i. 101; *Benth. Fl. Austr.* vii. 540. Johnson Grass. Stems erect, varying from 2 or 3 to 8 or 10ft. high, arising from a creeping rootstock; the nodes glabrous. Leaves long and flat, often rather broad, the midrib usually white and prominent. Panicle from 8 or 4in. to above 1ft. long, loose and often much branched. Fertile spikelets lanceolate, varying from 2 to above 3 lines long, pale coloured or scarcely purple, not rufous, with a few hairs at the base. Outer coriaceous glume faintly many-nerved, at length smooth and shining, 2nd glume rather smaller, 5-nerved, usually sprinkled with a few hairs; terminal glume hyaline, broad, ciliate, 2-lobed, the awn from the notch very fine and short, rarely nearly twice as long as the spikelet.—Maid. Gr. N.S.W. 87; Vasey Ag. Gr. U.S. Pl. 29; *Holcus halepensis*, Linn.; *Andropogon halepensis*, Sibth. Fl. Gr. i. 52, t. 68; Kunth, Enum. i. 502.

A Mediterranean species, much cultivated in some warm countries, introduced and a troublesome weed in cultivated lands.

On this grass may be seen at times the fungus *Uredo sorghi*, *Fuckel*, bearing the parasite *Darluca filum*, *Cast.*

2. **S. plumosum** (plumose), *Beauv. Agrost.* 182; *Benth. Fl. Austr.* vii. 540. A tall grass closely resembling *S. halepense*, but with the nodes bearded with a dense tuft of hairs and the leaves much narrower. Inflorescence and structure of the spikelets the same, but the smaller branches, pedicels and spikelets more or less villous with hairs usually rufous, besides the dense tuft at the base of the sessile spikelets. Spikelets varying from $2\frac{1}{2}$ to 4 lines long, lanceolate as in *S. halepense*, but less flattened and usually narrower. Outer glume at first several-nerved, at length rigid, shining and apparently nerveless except 2 ciliate nerves near the top, often turning almost black when ripe. Awn often short and capillary, but usually longer and stouter than in *S. halepense*. Ovary glabrous.—Turner Ag. Gaz. N.S.W. i.; *Holcus plumosus*, R. Br. Prod. 200; *Andropogon australis*, Spreng. Syst. i. 287.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*; Port Curtis and Port Molle, *M'Gillivray*; Rockingham Bay, *Dallachy*; Port Denison, *Fitzalan*; Brisbane River, Moreton Bay, *F. v. Mueller*, *Leichhardt* and others; Rockhampton and numerous localities in the south, *Bowman*, *Thozet* and others.

3. **S. fulvum** (brown), *Beauv. Agrost.* 164; *Benth. Fl. Austr.* vii. 541. A tall not very stout grass attaining sometimes 6 to 8ft., the nodes bearded with a dense tuft of hairs. Leaves narrow, with scabrous edges. Panicle loose, 4 to 8in. long, the hairs of the pedicels and spikelets of a rich brown as in the darker specimens of *S. plumosum*, but the sessile spikelets only $1\frac{1}{2}$ to 2 lines long, ovate or shortly conical at the top, not much flattened and usually black and shining when ripe. Awn $\frac{1}{2}$ to $\frac{3}{4}$ in. long. Ovary glabrous.—*Holcus fulvus*, R. Br. Prod. 199; *Andropogon tropicus*, Spreng. Syst. i. 287.

Hab.: Keppel Bay, *R. Brown*; Rockhampton, *O'Shanesy*; Rockingham Bay, *Dallachy*.

Also in tropical Asia, from Ceylon to the Archipelago, S. China and Japan.

4. **S. laxiflorum** (referring to the loose inflorescence), *Bail. 3rd Suppl. Syn. Ql. Fl.* 84. Decumbent, ascending to 2 or 3ft., glabrous except the inflorescence and a slight downiness about the nodes, stems somewhat compressed. Leaves narrow, tapering to filiform points; ligula short, scarious, but almost hidden in the longish hairs at the top of the sheath. Panicle nodding, somewhat secund, 2 or 8in. long, of few capillary branches never verticillate, solitary or in pairs and forked, each bearing usually 2 spikelets, the terminal one awned. Fertile spikelet scarcely 2 lines long, between two ciliate pedicels; outer glume densely

clothed with dark-brown or at times light-brown hairs; second glume nearly glabrous, glossy, and of a very dark colour; 3rd glume hyaline; awn over 1 in. long, much twisted in the lower half.

Hab: Mulgrave River.

The awns of this grass remind one of *Heteropogon contortus* by the manner in which they twist into knots, but it is a much more delicate grass. In inflorescence it approaches *Chrysopogon*, but the glumes are those of a *Sorghum*.

47. ANTHISTIRIA, Linn.

(The Græek name for a species of grass.)

(*Iseilema*, Anders.)

Spikelets 1-flowered or empty, 7 rarely 6 in a spike or cluster, 4 male or barren, either sessile or pedicellate in a whorl at the base of the hairy rhachis, 2 or sometimes 1 pedicellate and male or barren on the top of the rhachis with an intermediate sessile fertile one. Glumes in the barren spikelets usually 2, the outer one several-nerved, the inner thin and hyaline, in the male spikelets usually a 3rd smaller hyaline one; in the fertile spikelet glumes 4, the 2 outer ones nearly equal, usually rigid and coriaceous, the outer one obscurely 5 or 7-nerved, the 2nd with 2 prominent nerves the central one very faint, 3rd glume much smaller, very thin and hyaline; 4th very narrow and thin at the base, thickened into a long twisted awn usually bent above the middle. Palea very small and hyaline, sometimes scarcely conspicuous. Styles distinct. Grain free, enclosed in the hardened outer glumes.—Erect leafy branching grasses, the spikes or clusters singly pedunculate within sheathing bracts, or sessile in the bracts and collected many together in compound clusters forming short almost cyme-like leafy panicles.

The genus is spread over the warmer regions of the Old World, extending into South Africa. The 4 whorled barren spikelets sessile. Awn very long and rigid.

Spikelets in dense compound clusters, sessile within the bracts.

Bracts glabrous. Barren spikelets glabrous or sprinkled with long cilia.

Fertile spikelet glabrous or shortly pubescent at the end 1. *A. ciliata*.

Bracts sprinkled with long spreading hairs. Spikelets nearly of *A.*

ciliata

Spikelets with the surrounding barren ones on slender pedicels within the

sheathing bracts. Barren spikelets glabrous. Fertile one densely villous

with brown hairs

2. *A. frondosa*.

3. *A. avenacea*.

1. *A. ciliata* (ciliate), Linn.; Kunth, *Enum.* i. 481; Benth. *Fl. Austr.* vii. 542. Kangaroo Grass. Stems 1 to 3 ft. high. Leaves narrow, glabrous or the sheaths hairy; ligula very short, sometimes ciliate. Spikes or clusters of spikelets not numerous, sessile or the lower ones pedunculate in a short terminal leafy panicle, the leafy bracts subtending each spike sheathing at the base and tapering into points longer than the cluster, the short rhachis bearded with long brown hairs. Spikelets narrow, 4 to 5 lines long, 4 male or barren sessile at the base of the bearded rhachis, 2 or 1 pedicellate at the top, glabrous or sprinkled with a few long hairs: outer glume the largest, acute, many-nerved, 2nd shorter, thin and 3 or 5-nerved, 3rd thin and hyaline. Fertile terminal spikelet glabrous or shortly pubescent at the end; outer glume broad, obtuse, rather thick, about 7-nerved, 2nd rigid, rather shorter and narrower, with 2 prominent lateral nerves and a faint central one, 3rd narrow-oblong, very thin and hyaline; awn or 4th glume very long and rigid, the attenuate base not dilated.—Turner Ag. Gaz. N.S.W. i.; Bail. Ill. Mono. Gr. Q. i.; *A. australis*, R. Br. Prod. 200; Hook. f. Fl. Tasm. ii. 107, t. 156; F. v. M. Fragm. v. 207; *A. cæspitosa*, Anders. Monogr. Androp. 18, and, from the character given, *A. cuspidata*, Anders. l.c. 14.

Hab.: Abundant throughout the State.

There are two varieties of this. The northern form, which is probably the true *A. ciliata* of Linnæus, is not so tussocky, sprouts more from the joints and forms large tangled masses, and it is also very leafy. The other, *A. australis*, of R. Br. is an upright tussocky plant of which also there is a glaucous form with larger leaves.

On the southern forms may be seen at times the fungi *Ustilago bromivora*, Walldk. and a variety of *Cerebella paspali*, Cke. and Mass.

2. ***A. frondosa*** (leafy), R. Br. *Prod.* 200; *Benth. Fl. Austr.* vii. 542. Very near *A. ciliata*, but upon a larger scale. Stems erect and branching, from 2 or 8ft. to twice that height, frequently flattened under the lower nodes. Leaves glabrous or the upper sheaths ciliate. Leafy panicle dense, often nodding, the leafy bracts narrow, ciliate on the back with long spreading hairs, the outer ones 2 to 8in. long. Spikes or clusters as in *A. ciliata*, with the 4 involucrel spikelets sessile, the outer glume of the fertile spikelet very rigid, scarcely nerved, obtuse, pubescent at the top with short rigid hairs. Awn as long as or often longer than in *A. ciliata*. Many of the spikes reduced to the 4 involucrel barren spikelets surrounding a rudimentary one.—Bail. Ill. Mono. Gr. Q. i.

Hab.: Etheridge and many other northern localities.

This species is sometimes infested with the fungus *Ustilago bursa*, Berk.

3. ***A. avenacea*** (Oat-like), F. v. M. *Fragm.* v. 206; *Benth. Fl. Austr.* vii. 543. Oat Grass. Stems from a more or less silky-hairy or woolly base, 2 to 6ft. high. Leaves very narrow, glabrous. Sheathing bracts narrow, membranous, glabrous, 1 to 2in. long. Spikes or clusters all on rather long, slender, glabrous or ciliate peduncles within the last bract. Barren spikelets either reduced to a single several-nerved rigid glume with a small hyaline one inside, or more developed, enclosing a male flower, the 4 involucrel ones sessile. Fertile spikelets about 4 lines long, the rigid outer glumes, especially the lowest, densely villous with brown hairs. Awn long and rigid as in the 2 preceding species.—Turner Austr. Gr. 8; *A. basisericea*, F. v. M. *Fragm.* v. 207.

Hab.: Brisbane River, Bailey; Condamine and Gwydir Rivers, etc., Leichhardt; Rockhampton and other localities in the southern district, O'Shanesy, Bowman and others; Peak Downs, F. v. Mueller.

48. ISEILEMA, Hack.

Differs from *Anthistiria* in each spike being jointed below the involucrel spikelets on the top of its peduncle, and falling away from it as a whole after flowering; whereas in *Anthistiria* the involucrel spikelets are persistent and the rest of the spike deciduous. In the former case the dispersal of the spikelets is supposed to be by the wind but in the latter it is supposed to be by the callus of the bisexual spikelets becoming attached to animals.

This genus is included in *Anthistiria* in Benth. and Hook. Gen. Pl. but retained by Hooker in the Fl. of Brit. Ind.

It is well pointed out by Sir J. D. Hooker that one of the marked distinctions between *Anthistiria* and *Iseilema* is in the dispersal of seed, viz.: In the first the hermaphrodite glumes alone disarticulate, and are carried away by adhesion to the coats of animals, while in the latter the articulation being below the involucrel spikelets the whole is carried away by the wind.

1. ***I. Mitchellii*** (after Sir Thos. Mitchell), *Anders. Monogr. Androp.* 24. Landsborough Grass. Quite glabrous annual grass, sometimes forming dense leafy masses from 6 to 18in. high. Leaves flat, appearing almost articulate on the short flat prominently striate sheaths. Floral leaves or bracts with coriaceous sheaths and short lanceolate laminæ. Panicle small, dense, almost cyme-like as in *Apluda*, with very numerous small spikes or clusters, each subtended by a scarcely longer bract. Spikelets scarcely 2 lines long, glabrous, the 4 involucrel ones pedicellate, the fertile one rather longer than the 2 pedicellate barren ones beside it. Glumes all thin, the outer one acute with several green nerves, the 2nd

with 1 or 8 nerves, the awn very fine, scarcely more than as long again as the spikelet.—*Anthistiria membranacea*, Lindl. in Mitch. Trop. Austr. 88; Benth. Fl. Austr. vii. 548; Bail. Ill. Mono. Gr. Q. i.

Hab.: An inland grass widely dispersed.

A grass well worthy of extensive cultivation both for feeding or hay, of rapid growth when under cultivation, the stems long and weak, forming an entangled mass one to two feet deep. This grass is very brittle, but it is said that stock are so partial to it that they often lick up the broken pieces off the ground,

49. **PHALARIS*, Linn.

(From the brilliant shining seeds.)

Spikelets 1-flowered, flat, densely crowded in an ovoid or cylindrical spike or spikelike panicle, the rhachis of the spikelet articulate above the outer glumes. Glumes usually 6, 2 outer larger ones thin, complicate, 3-nerved, the keel bordered by a scarious wing, the 3rd and 4th small lanceolate or reduced to small bristles or 1 deficient, the 5th smaller, complicate, very finely 5-nerved or apparently 4-nerved, the central nerve short and scarcely conspicuous enveloping the 6th glume which is also complicate, enclosing the flower, apparently 2-nerved, but the external angle between the nerves longitudinally ciliate. No ordinary palea. Stamens 3. Styles distinct. Grain enclosed in the 2 upper glumes.

A small genus, chiefly from the Mediterranean and neighbouring regions.

1. *P. canariensis* (of Canary Islands), Linn.: Kunth, Enum. i. 81.; Benth. Fl. Austr. vii. 557. Canary-seed Grass. An annual 3 to 5ft. high. Spikelike panicle ovoid 2 to 3in. long and exceeding 1in. broad. Spikelets 2 to 3 lines broad, the wings of the outer glumes broad and whitish, the intermediate glumes equal, lanceolate, pubescent, more than half as long as the inner ones, the inner ones villous.—Sibth. Fl. Gr. t. 55; Trin. Spec. Gram. t. 74.

Hab.: Naturalised in several localities.

The plant is much cultivated, and is probably a native rather of South Europe or North Africa than of the Canary Islands, but it has now established itself in so many places that it is difficult to say where it is really indigenous.

50. *MICROLÆNA*, R. Br.

(From *mikros*, small, and *chlaina*, a covering; in allusion to the small glume.)

(*Diplax*, Hook. f.)

Spikelets 1-flowered, on filiform pedicels in a narrow loose panicle, the rhachis of the spikelet articulate above the 2 outer glumes. Glumes 6, 2 outer short and persistent, 3rd and 4th long narrow and awned, 5th and 6th shorter acute unawned, all keeled. Flower terminal. No palea. Lodicules large, very thin. Stamens 4 or 2. Styles distinct. Grain enclosed in the larger glumes but free from them.

A small genus, confined to Australia and New Zealand.

1. *M. stipoides* (Stipa-like), R. Br. Prod. 210; Benth. Fl. Austr. vii. 532. Meadow Rice Grass. Stems from a perennial rhizome erect or ascending, 1 to 2ft. high. Leaves usually rather short, flat or convolute and very acute, glabrous or slightly hairy. Panicle narrow, 3 to 6in. long, with filiform erect branches and pedicels. Spikelets narrow, 4 to 5 lines long without the awn, 2 outer persistent glumes minute; 3rd and 4th glumes narrow, rigid, with 8 prominent scabrous nerves, tapering into a fine awn, with a tuft of hairs at their base on the slightly elongated rhachis, the 4th rather longer than the 3rd and its awn sometimes much longer, 5th glume rather shorter, acute but not awned, the nerves not prominent, 6th shorter very narrow and thin but stiff. Stamens 4.—Hook. f. Fl. Tasm. ii. 105; Buch. Ind. Gr. N.Z. pl. ii.; Bail. Ill. Mono. Gr.

Q. i. ; Turner Ag. Gaz. N.S.W. ii. Pl.; *Ehrharta stipoides*, Labill. Pl. Nov. Holl. i. 91, t. 118; F. v. M. Fragm. vii. 90; *Microlana Gunnii*, Hook. f. l.c. 105, t. 155, A.

Hab.: Brisbane River, *Bailey*; Darling Downs, *Leichhardt*.
Also in New Zealand.

51. ARISTIDA, Linn.

(Said to be from *Arista*, an ear of corn.)

Spikelets 1-flowered, on filiform pedicels or nearly sessile in a terminal panicle, the rachis of the spikelet articulate above the 2 outer glumes. Glumes 8, narrow, 2 outer usually persistent, keeled empty and unawned; terminal or flowering glume narrow, rigid, rolled round the flower, entire, with a terminal trifid awn. Palea small, enclosed in the flowering glume. Styles distinct. Grain narrow, enclosed in the hard upper glume but free from it, the whole falling off with the stipes and awn as in *Stipa*. All the Australian species glabrous, with convolute more or less subulate leaves.

The genus is widely spread over the tropical and some temperate regions of the New and the Old World.

SECTION I. *Arthratherum*.—Awn articulate on the glume, entire and spirally twisted below the branches. Flowering glume much shorter than the outer ones.

Awn 2 to 3in. long below the branches, which are at least as long 1. *A. hygrometrica*.
Awn about 1½in. below the branches, which vary from 1½ to 2½in. 2. *A. stipoides*.
Awn ¾ to ¾in. below the branches, which vary from 1 to 3in. 3. *A. arenaria*.

SECTION II. *Chetaria*.—Awn not articulate and divided to the glume into 3 branches, the glume itself when barren sometimes twisted but not the awn. Flowering glume about as long or longer than the outer ones.

Panicle short broad and dense. Glumes ½in. long. Awns long 4. *A. Behriana*.
Panicle-branches very long, at length spreading, with few spikelets on long pedicels. Glumes at least ½in. long 5. *A. leptopoda*.
Panicle loose, at length pyramidal. Pedicels short. Outer glumes 2 to 3 lines long; flowering glume much longer. Awns short 6. *A. vagans*.
Panicle narrow, rather loose. Outer glumes as long as the flowering one. Glumes scarcely 3 lines. Awns under ½in. long 7. *A. ramosa*.
Glumes 4 to 5 lines. Awns ¾ to 1in. long 8. *A. calycina*.
Panicle narrow, dense. Spikelets sessile and crowded on the short branches. Glumes 3 lines or the flowering rather longer. Awns 4 to 6 lines 9. *A. Adscensionis*.

1. ***A. hygrometrica*** (sensitive of moisture), *R. Br. Prod.* 174; *Benth. Fl. Austr.* vii. 561. A glabrous, slender, rigid but brittle grass, branching at the base, 1 to 2ft. high. Leaves subulate, rigid, with closely appressed sheaths minutely ciliate at the orifice. Panicle narrow, scarcely branched, 6 to 10in. long without the awns. Spikelets few, on short erect pedicels. Outer glume obtuse, 8 to 9 lines long, prominently 3-nerved or sometimes 4-nerved by the doubling of the outer one; 2nd glume hard and convolute, nearly 1½in. long, acute, 1-nerved; flowering glume narrow, convolute, glabrous, about 8 lines long on a hairy stipes of 1 to 1½ line. Awn articulate on the glume, at least 2in. long below the branches, the middle branch 2½ to 4in., the lateral ones as long or shorter. Palea a little more than 1 line long. Lodicules at least as long, finely striate at the base.—Beauv. *Agrost.* t. 8, f. 8; Trin and Rupr. *Gram. Stip.* 162.

Hab.: Gulf country.

2. ***A. stipoides*** (*Stipa*-like), *R. Br. Prod.* 174; *Benth. Fl. Austr.* vii. 561. Habit and foliage of *A. hygrometrica* but more slender. Panicle long with a slender rachis, the lower short erect branches usually bearing 2 spikelets, the upper spikelets singly distant on short erect pedicels. Outer glume 1-nerved, about ¾in. long, glabrous or minutely pubescent; 2nd rigid, convolute, ¾in.;

flowering glume scarcely smaller than in *A. hygrometrica* but the awn much finer, about $1\frac{1}{2}$ in. below the branching, the branches $1\frac{1}{2}$ to 2 in. long.—Trin. and Rupr. Gram. Stip. 161; F. v. M. Fragm. viii. 111; Maid. Gr. N.S.W. 106.

Hab.: Islands of the Gulf of Carpentaria, R. Brown; Gilbert River, Sullivan.

8. ***A. arenaria*** (a plant of sandy land), *Gaudich. in Freyc. Voy. Bot.* 407; *Benth. Fl. Austr.* vii. 561. Very near *A. stipoides* and reduced to that species by F. v. Mueller, Fragm. viii. 111, but a smaller plant, the stems usually not above 6 in. below the inflorescence, rarely slender leafy and nearly 1 ft. long. Leaves much finer, almost filiform. Panicle narrow and spike-like, scarcely branched or more frequently reduced to a simple raceme, 3 to 4 in. long without the awns. Outer glumes very narrow and fine-pointed, usually dark coloured, the lowest nearly $\frac{1}{2}$ in. long, the 2nd $\frac{1}{2}$ in.; flowering glume rather smaller than in *A. stipoides*, the awn under 1 in. and usually $\frac{1}{2}$ to $\frac{3}{4}$ in. below the branching, the branches very fine, varying from 1 to 3 in.—Trin. and Rupr. Gram. Stip. 163; Maiden Ag. Gaz. N.S.W. x. Pl.; *Arthratherum arenarium*, Nees in Pl. Preiss. ii. 98; *Aristida contorta*, F. v. M. in Trans. Vict. Inst. 1855, 44.

Hab.: King's Creek, Bowman; Brisbane River and other southern localities.

4. ***A. Behriana*** (after Dr. H. Behr), *F. v. M. in Trans. Vict. Inst.* 1855, 44; *Benth. Fl. Austr.* vii. 562. Stems ascending, usually under 1 ft. below the inflorescence. Leaves subulate at the end, somewhat dilated at the base and the upper sheaths often rather broad and loose. Panicle dense, 2 to 3 in. long and almost as broad, the spikelets nearly sessile. Outer glumes nearly equal, the lowest fine-pointed, the 2nd usually rather longer than the flowering glume. Flowering glume about $\frac{1}{2}$ in. long; with 3 nearly equal sessile awns fine and above 1 in. sometimes nearly 2 in. long.

Hab.: Recorded for Queensland by F. v. M.

5. ***A. leptopoda*** (pedicels slender), *Benth. Fl. Austr.* vii. 562. Stems rather stout, from scarcely 6 in. to 2 ft. high. Leaves long and subulate, with rather broad loose sheaths. Panicle very loose. 6 in. to 1 ft. long, with numerous long rigidly filiform branches at first erect, at length spreading horizontally, bearing few spikelets on filiform pedicels. Outer glumes unequal, with long points, the longest usually about as long as the flowering glume. Flowering glume 6 to 8 lines long, on a very short scarcely ciliate stipes, with 3 nearly equal sessile awns $\frac{1}{2}$ to 1 in. long. Palea small and rigid.

Hab.: Brisbane River, Bailey; Darling Downs, Leichhardt; Peak Downs, Burkitt; Kennedy District, Daintree.

This and the two following species are known by the name of "3-awned Spear Grass."

6. ***A. vagans*** (spreading), *Cav. Ic.* v. 45, t. 471; *Benth. Fl. Austr.* vii. 562. Stems slender, erect and 1 to 2 ft. high, or diffuse and much branched. Leaves slender, almost filiform, usually short. Panicle 3 to 6 in. long, at first narrow, at length branching and pyramidal, the pedicels very short. Outer glumes usually dark-coloured, 2 to 3 lines long, the 2nd longer than the lowest, both with 1 prominent nerve. Flowering glume always longer than the outer ones and often twice as long. Awns sessile, about 4 lines long. Palea very short.—R. Br. Prod. 173; F. v. M. Fragm. viii. 111; Maiden Ag. Gaz. N.S.W. xi. Pl.; *A. ramosa*, Sieb. Agrostoth. n. 55; *A. parviflora*, Steud. Syn. Glum. i. 140 (from the char. given).

Hab.: Brisbane River, Moreton Bay, F. v. Mueller; Rockhampton, O'Shanesy; Condamine Hartmann.

Var. *gracillima*. Stems long, slender and branching; panicle filiform.

Hab.: Rockhampton, O'Shanesy.

Var. *compacta*. Panicle short and compact, but the spikelets and awns quite of *A. vagans*.

Hab.: Warwick, Beckler, Nernst.

7. **A. ramosa** (branching), *R. Br. Prod.* 178; *Benth. Fl. Austr.* vii. 568. Very nearly allied to *A. calycina*, and almost intermediate between that and *A. vagans*. Panicle narrow, with erect or scarcely spreading branches and the outer glumes as long as the flowering ones or nearly so as in *A. calycina*, but the spikelets much smaller, the glumes scarcely above 8 lines and the awns under $\frac{1}{2}$ in. long.

Hab.: Brisbane River, Moreton Bay, *F. v. Mueller, Bailey*; Rockhampton, *O'Shanesy*; Herbert's Creek, *Bowman*; Darling Downs, *Law*.

Var. ? *leptathera*. Panicle spreading, awns lin. long, but the spikelets of *A. ramosa*.

Hab.: Dry-beef Creek, *Leichhardt*.

Var. *compacta*. Panicle short and dense.

Hab.: Gracemere, *O'Shanesy*.

8. **A. calycina** (calyx or outer glume prominent), *R. Br. Prod.* 178; *Benth. Fl. Austr.* vii. 568. Stems tufted, erect, 1 to 2 ft. high. Leaves very narrow, mostly subulate. Panicle narrow, often above 6 in. long, with few short erect branches, rarely at length spreading, each bearing 1 or 2, or the lower ones several, but few sessile or shortly pedicellate spikelets. Spikelets in the typical form 4 to 5 lines long without the awns. Outer glumes with fine points, the 2nd as long as or longer than the flowering glume. Awns slender, sessile, $\frac{3}{4}$ to $1\frac{1}{2}$ in. long. Palea rather long.—*Maiden Ag. Gaz. N.S.W.* xi. Pl.

Hab.: Keppel Bay, *R. Brown*; Flinders River and Nerkool Creek, *Bowman*; Darling Downs, *Law*; Peak Downs, *Burkitt*.

Inland specimens of this and some other species I have frequently found to be infested with the blight-fungus *Ustilago segetum*, *Bull.*

9. **A. adscensionis** (after the island of Ascension), *Linn.; Sp. Pl.* 82. A very variable grass, distinguished by its narrow spikelets crowded and almost imbricate along the short erect branches of a narrow compact panicle. Stems ascending or erect, above 1 ft. high. Leaves narrow, ending in subulate points. Panicle from 2 and 3 in. long and spikelike, to 6 or 8 in. and interrupted at the base. Spikelets sessile along the branches and often purplish. Outer glumes about 8 lines long. Flowering glumes usually longer. Awns sessile, varying from 4 to 6 lines or rather more.—*A. vulgaris*, *Trin. and Rupr. Gram. Stip.* 181; *A. depressa*, *Retz.*; *Kunth, Enum. i.* 190; *Benth. Fl. Austr.* 568; *Duth. Ind. Gr. pl. xxx. and A. Hystrix*, pl. xxxi.

Hab.: Peak Downs, *Burkitt*; hill scrubs of southern localities.

Widely spread over tropical and subtropical Asia and Africa and the south Mediterranean regions.

52. STIPA, Linn.

(Panicles feather-like.)

Spikelets, 1-flowered, on filiform pedicels or nearly sessile in a terminal panicle, the rhachis of the spikelet articulate above the 2 outer glumes. Glumes 8, narrow, 2 outer usually persistent, membranous, keeled, empty, unawned; terminal or flowering glume narrow, rigid, rolled round the flower, with a terminal undivided bent awn spirally twisted below the bend. Palea enclosed in the flowering glume. Lodicules usually large. Anthers usually tipped with a tuft of hairs. Styles distinct. Grain narrow, enclosed in the hard upper glume but free from it.—A short continuation of the rhachis of the spikelet above the articulation forms usually a stipes to the flower and fruit, falls off with it and is usually ciliate with short hairs, the awn is more or less distinctly articulate on the flowering glume, but usually remains attached to it after it falls.

The genus is widely dispersed over the tropical and temperate regions of the New and the Old World. The Australian species, however, belong to the group or section *Neostipa*, *Trin.*, which is exclusively Australian, one of them only extends to New Zealand, the remaining ones appear to be all endemic.

Flowering glume glabrous or slightly hairy at the end, very shortly produced into hyaline lobes or entire. Palea very small or rarely half as long as the glume.

Panicle branches long and plumose. Spikelets 4 to 6 lines long . . . 1. *S. elegantissima*.

Panicle very much branched, glabrous or slightly pubescent. Spikelets scarcely $1\frac{1}{2}$ line long . . . 2. *S. micrantha*.

Flowering glume silky-hairy, the margins not dilated under the awn. Palea nearly as long as the glume.

Ligula elongated, not ciliate. Panicle loose. Leaves slender, filiform . 3. *S. setacea*.

Ligula short, ciliate. Awn plumose-hairy in the lower part. Panicle dense, 6 to 10 in. long. Awn $1\frac{1}{2}$ to 4 in. long, shortly plumose-hairy all round to the bend or higher up . . . 4. *S. semibarbata*.

Ligula short, ciliate. Awn glabrous or slightly pubescent.

Lowest glume usually slightly dilated and truncate or toothed at the end. Flowering glume narrow. Panicle dense or at length long and loose . . . 5. *S. pubescens*.

Lowest glume usually 3-pointed. Flowering glume rather broad. Panicle very loose . . . 6. *S. aristiglumis*.

Lowest glume always fine-pointed.

Leaves slender, glabrous or pubescent, the upper sheaths sometimes dilated. Panicle loose . . . 7. *S. scabra*.

1. ***S. elegantissima*** (very elegant), *Labill. Pl. Nov. Holl.* i. 23, t. 29; *Benth. Fl. Austr.* vii. 566. Stems from a horizontal rhizome erect and branching, rigid though rather slender, 2 to 8 ft. high. Leaves narrow, mostly erect, convolute when dry, glabrous. Panicle very loose, 6 to 8 in. long, at length broadly spreading, the rhachis and long filiform branches elegantly plumose with fine spreading hairs. Outer glumes 4 to 6 lines long, equal or the lowest much shorter, acutely acuminate; flowering glume shorter, on a short hairy stipes but glabrous, the involute margins shortly hyaline at the end and produced into a very short obtuse lobe on each side of the awn. Awn 1 to $1\frac{1}{2}$ in. long or sometimes even longer. Palea less than $\frac{1}{2}$ as long as the glume.—*R. Br. Prod.* 175; *Hook. f. Fl. Tasm.* ii. 111; *Nees in Pl. Preiss.* ii. 90; *F. v. M. Fragm.* viii. 108.

Hab.: Recorded for Queensland by *F. v. M.*

2. ***S. micrantha*** (flowers small), *Cav.?* *R. Br. Prod.* 175; *Benth. Fl. Austr.* vii. 566. Bamboo Grass. Stems several feet high, not stout but rigid, sometimes spreading or scrambling with the branches in dense clusters, sometimes long and little-branched. Leaves very slender, the sheaths often long and loose, glabrous. Panicle loose but often narrow, from under 6 in. to above 1 ft. long, with very numerous capillary glabrous branches. Spikelets the smallest in the genus, pedicellate on the ultimate branches. Outer glumes linear, very thin, nearly equal, scarcely $1\frac{1}{2}$ line long. Flowering glume shorter, nearly glabrous, on a very short and ciliate stipes, entire at the top, the awn very slender, about $\frac{1}{2}$ in. long. Palea not above $\frac{1}{2}$ the length of the glume.—*Sieb. Agrostoth.* n. 64, and n. 82; *S. verticillata*, *Nees in Spreng. Syst. Cur. Post.* 30; *Streptachne verticillata*, *Trin. and Rupr. Gram. Stip.* 8; *Stipa ramosissima*, *Nees in Sieb. Agrostoth.* n. 82; *Trin. in Mem. Acad. Petersb.* ser. 6, i. 74; *F. v. M. Fragm.* viii. 105; *Streptachne ramosissima*, *Trin. and Rupr. Gram. Stip.* 7, who refer to it *Urachne ramosissima*, *Trin. Gram. Unifl.* 173, there very insufficiently described.

Hab.: Brisbane River, *Bailey*; Dawson River, *F. v. Mueller*; Darling Downs, *Leichhardt*; Warwick, *Beckler*.

It appears to me probable that R. Brown was correct in identifying this plant with the *S. micrantha* described and figured by Cavanilles *l.c.* v. 42, t. 467, although more recent botanists have thought that Cavanilles' description agreed better with the *Dichelachne sciurea*; that author, however, adds to his plate a magnified figure of a flowering glume and awn which is wholly inapplicable to the *Dichelachne*, but agree well with the present species, which is also well represented (in its rather poor state) by Cavanilles' general figure. The awn is certainly articulate on the glume, and therefore not that of *Streptachne*.—*Benth.*

8. **S. setacea** (bristly), *R. Br. Prod.* 174; *Benth. Fl. Austr.* vii. 568. Stems slender, 1 to 2ft. high or rarely more. Leaves fine and short, tufted at the base of the stems, those on the stem few with long sheaths; ligula elongated, not ciliate, often broken off from dried specimens. Panicle loose, 4 to 10in. long, glabrous. Outer glumes very thin, narrow, acuminate, 4 to 5 lines long. Flowering glume much shorter, pubescent or villous, entire at the top. Awn glabrous, very fine, $1\frac{1}{2}$ to above 2in. long. Palea as long as the glume, often hardened when ripe.—Hook. f. *Fl. Tasm.* ii. 110, t. 157; *Maid. Gr. N.S.W.* 118.

Hab.: Warwick to Wallangarra.

4. **S. semibarbata** (half-bearded), *R. Br. Prod.* 174; *Benth. Fl. Austr.* vii. 568. Stems $1\frac{1}{2}$ to near 3ft. high. Leaves narrow, convolute, often almost subulate, glabrous or shortly pubescent, the ligula very short and ciliate. Panicle oblong, rather dense, 6 to 10in. long, with erect branches. Outer glumes 6 to 9 lines long, tapering into very thin long acute points. Flowering-glume silky-hairy, scarcely 3 lines long, entire at the top. Awn varying from under 2in. to near 4in. long, shortly plumose-hairy to the bend or sometimes nearly to the end.—Hook. f. *Fl. Tasm.* ii. 110; *F. v. M. Fragm.* viii. 104.

Hab.: Southern Downs country.

5. **S. pubescens** (pubescent), *R. Br. Prod.* 174; *Benth. Fl. Austr.* vii. 569. Stems 2 to 3ft. high, with pubescent nodes. Leaves narrow, convolute, the ligula very short, usually ciliate. Panicle rather loose in the typical form, very loose in some varieties. Outer glume unequal, the longest about $\frac{1}{2}$ in., scarious at the end and often but not always truncate, notched or 3-toothed, rarely very acute. Flowering glume much shorter, hairy, entire at the top. Awn above 2in. long, pubescent in the lower part or glabrous. Palea rather long.—Sieb. *Agrostoth.* n. 59, 66; Hook. f. *Fl. Tasm.* ii. 110; *F. v. M. Fragm.* viii. 104; *S. rudis*, Spreng. *Syst. Cur. Post.* 81; *S. commutata*, Trin. and Rupr. *Gram. Stip.* 49.

Hab.: Southern Downs country.

6. **S. aristiglumis** (outer glume pointed), *F. v. M. in Trans. Vict. Inst.* 1855, 43, *Fragm.* viii. 103; *Benth. Fl. Austr.* vii. 570. Very nearly allied to *S. pubescens*, and should probably be added to its varieties. Habit and foliage the same. Panicle much looser, spikelets smaller, the outer glume usually produced into 1 to 3 fine points, the fruiting glume broader; awn of *S. pubescens* but usually glabrous.

Hab.: Brisbane River, *Bailey*; Darling Downs, *Woolfs*.

This is a strong-growing grass producing a large quantity of excellent fodder; indeed it is one of the very best species found on the Downs; the seeds also are not so troublesome as some others of the genus.

7. **S. scabra** (rough), *Lindl. in Mitch. Trop. Austr.* 81; *Benth. Fl. Austr.* vii. 570. Stems in the typical form slender, tufted, 1 to 2ft. high. Leaves subulate or filiform, rather short, glabrous or slightly pubescent, the upper sheath scarcely dilated; ligula very short, more or less ciliate. Panicle very loose, $\frac{1}{2}$ in. to above 1ft. long, with long capillary slightly spreading glabrous branches and pedicels. Outer glumes at first almost hyaline, at length, especially in western specimens, often purplish or rigid, tapering into long points, the longest about $\frac{1}{2}$ in. long. Flowering glume about 2 lines long, silky-hairy, entire at the tip. Awn fine, glabrous, $\frac{3}{4}$ in. long or more. Palea nearly as long as the glume.

Hab.: Southern Downs country.

The species, distinguished from *S. setacea* by the short fine ligula, from *S. pubescens* by the more slender habit, the outer glumes both with long fine points, and the long fine awns, appears to be very abundant in the desert country and very variable.

58. STREPTACHNE, R. Br.

(Twisted glume.)

Spikelets 1-flowered, on short filiform pedicels in a narrow terminal panicle, with the structure of *Stipa*, except that the awn is continuous with the end of the flowering glume without any articulation.

The limits and area of the genus are as yet very uncertain.

1. **S. stipoides** (Stipa-like), *R. Br. Prod.* 174; *Benth. Fl. Austr.* vii. 572. Only known from two very imperfect specimens, one in Herb. Banks, the other in Herb. R. Brown, each consisting of the summit of the stem without leaves, bearing a very slender and loose little-branched panicle of 5 to 6 in. Outer glume 4 to 5 lines long, tapering into long fine points. Flowering glume narrow, glabrous, tapering into a very fine twisted and bent awn of $\frac{3}{4}$ in. Stamens 8.

Hab.: Endeavour River, *Banks and Solander*.

54. ALOPECURUS, Linn.

(From the English name of "Foxtail" for some species.)

Spikelets 1-flowered, flat, densely crowded into a cylindrical spike or spikelike panicle. Glumes 8, 2 outer complicate, keeled, acute but not awned, 3rd under the flower shorter, keeled, with a short slender dorsal awn. No 2-nerved palea or lodicules. Stamens 8. Styles distinct. Grain enclosed in the scarcely hardened glumes, but free from them.

A small genus, widely spread over the temperate and colder regions of both the northern and the southern hemispheres, only penetrating into the tropics as occasional weeds.

1. **A. geniculatus** (knee-jointed), *Linn.*; *Kunth, Enum.* i. 24, ii. t. 7; *Benth. Fl. Austr.* vii. 555. A perennial or sometimes annual only, glabrous except the spike. Stems usually procumbent at the base, bending upwards at the lower nodes, sometimes only 8 or 4 in., often 1 ft. high or more. Leaves narrow, the upper sheaths broad and loose. Spike 1 to 2 in. long, closely imbricate but slender. Outer glumes hairy on the keel, scarcely pointed, usually but little more than 1 line long, free or scarcely united at the base, the hair-like awn of the flowering glume not projecting above 1 line beyond them.—*Reichb. Ic. Fl. Germ.* t. 49; *Hook. f. Fl. Tasm.* ii. 109; *F. v. M. Fragm.* viii. 188; *Turner Austr. Gr.* i.; *Buch. Ind. Gr. N.Z. Pl.* v.; *A. australis*, *Nees* in *Hook. Lond. Journ.* ii. 412.

Hab.: Darling and Amby Downs.

Common in the temperate regions of the northern hemisphere, and as an introduced weed in the southern hemisphere and in some places within the tropics. Perhaps truly indigenous in Queensland but uncertain.

55. ECHINOPOGON, Beauv.

(Referring to the very rough beards.)

Spikelets 1-flowered, nearly sessile in a dense panicle contracted into a head or short spike, the rachis of the spikelet articulate above the 2 outer glumes and produced into a short bristle above the flower. Glumes 8, 2 outer persistent, acute, keeled; flowering glume thin, 5-nerved, 3-lobed, the lateral lobes unawned, the central one produced into a fine straight awn. Palea narrow. Styles distinct, the stigmas very shortly plumose. Grain enclosed in the flowering glume but free from it.

The genus is limited to the single Australian species, which extends only into New Zealand.

1. **E. ovatus** (ovate), *Beauv. Agrost.* 42, t. 9, f. 5; *Benth. Fl. Austr.* vii. 599. An erect glabrous grass, from under 1 ft. to above 2 ft. high. Leaves flat, very scabrous, the asperities reversed on the sheath and back of the blade, erect on the

upper surface. Head or spikelike panicle on a long terminal peduncle, varying from ovoid-globular and $\frac{1}{2}$ in. diameter to oblong-cylindrical and 2 in. long. Spikelets numerous and densely crowded, about $1\frac{1}{2}$ line long without the awns. Outer glumes lanceolate, boat-shaped, the keel prominent green and ciliate. Flowering glume rather broad, surrounded by a tuft of hairs, the lateral lobes very short, acute, rigid at the base, the central one shortly flat at the base, tapering to an awn of 2 to 4 lines. Palea nearly as long as the glume. Bristle continuing the axis at the back of the palea usually shorter than the glume, bearing a short tuft of hairs or rudimentary glume.—Hook. f. Fl. Tasm. ii. 117; Sieb. Agrost. n. 89; Buch. Ind. Gr. N.Z. Pl. xiii. B.; *Agrostis ovata*, Forst.; Labill. Pl. Nov. Holl. i. 19, t. 21; R. Br. Prod. 171; *Cinna ovata*, Kunth, Enum. i. 208; F. v. M. Fragm. viii. 106; *Echinopogon Sieberi*, Steud. Syn. Glum. i. 188 (from the reference to Sieber).

Hab.: Brisbane River, Moreton Bay, *Bailey*; head of the Gwydir River, *Leichhardt*.

56. AMPHIPOGON, R. Br.

(Referring to the hairs round the rhachis of the spikelet.)

(*Ægopogon*, Beauv.; *Gamelythrum*, Nees.)

Spikelets 1-flowered, nearly sessile in a dense panicle contracted into a head or short spike, the rhachis of the spikelet articulate above the 2 outer glumes, and not continued beyond the flower. Glumes 3, 2 outer persistent, membranous, 3-nerved, acute or tapering to an awn-like point, rarely 3-fid; flowering glume raised on a short hairy stipes (the rhachis of the spikelet), closed round the flower, deeply divided into 3 narrow lobes tapering into straight points or awns. Palea usually as long as the flowering glume, deeply divided into 2 narrow rigid lobes or awns. Styles united at the base, free upwards. Grain enclosed in the slightly hardened upper glume.—Perennial grasses with convolute terete or subulate leaves.

The genus is endemic in Australia.

1. **A. strictus** (upright), R. Br. Prod. 175; Benth. Fl. Austr. vii. 597. Stems from a horizontal rhizome or tufted branching base erect and slender, usually above 1 ft. high. Leaves rather short, erect, subulate, glabrous. Spike-like panicle dense, oblong or cylindrical, $\frac{1}{2}$ to $1\frac{1}{2}$ in. long, but little branched. Outer glumes broad, concave, faintly 3-nerved, almost scarious, entire when perfect, the outer one about 2 lines, the inner rather longer and more acute. Flowering glume on the short hairy stipes shorter than the outer glume, with 2 short rows of hairs on the back, divided into 3 rigid ciliate linear lobes or awns longer than the entire part. Palea narrow, deeply divided to 2 rigid lobes similar to those of the flowering glume. Seed separable from the membranous pericarp.—Turner Austr. Gr. 2; *Ægopogon strictus*, Beauv. Agrost. 122; *Amphipogon caricinus*, F. v. M. in Linnæa, xxv. 445; *A. Brownei*, F. v. M. Fragm. viii. 201, partly.

Hab.: Barcoo River, *S. Browne*.

57. SPOROBOLUS, R. Br.

(Referring to the seeds being cast to the outside of the panicle.)

Spikelets small, 1-flowered, nearly sessile or pedicellate in a narrow spikelike or loose and pyramidal panicle, the rhachis of the spikelet very short, glabrous, scarcely articulate, not continued beyond the flower. Glumes 3, persistent or separately deciduous, unawned, slightly keeled or convex and obscurely nerved, 2 outer empty ones usually unequal; flowering glume as long or longer. Palea about as long as the glume, with 2 nerves usually prominent, and readily splitting

between them. Styles very short. Grain free, readily falling away from the glume, the pericarp loosely enclosing the seed or very thin and evanescent.

The genus is widely spread over the tropical and some more temperate regions of both the New and the Old World.

- | | |
|---|------------------------------|
| Stoloniferous, stems trailing. Inflorescence like the next | 1. <i>S. Benthami</i> . |
| Panicle narrow, spikelike, continuous or interrupted, the short erect branches flowering from the base. | |
| Outer and flowering glumes nearly equal. Leaves usually short rigid and spreading | 2. <i>S. virginicus</i> . |
| Outer glumes unequal, shorter than the flowering one. Leaves rather long | 3. <i>S. indicus</i> . |
| Panicle narrow, loose, with short spreading scattered branches | 4. <i>S. diander</i> . |
| Panicle loosely pyramidal, the branches spreading in regular distant whorls. | |
| Spikelets loosely pedicellate, minute. | |
| Leaves rigidly ciliate. Glumes obtuse | 5. <i>S. pulchellus</i> . |
| Leaves not at all or minutely ciliate. Glumes narrow, acute | 6. <i>S. Lindleyi</i> . |
| Spikelets nearly sessile, crowded along the branches | 7. <i>S. actinocladius</i> . |

1. ***S. Benthami*** (after Geo. Bentham, author of the "*Flora Australiensis*," *Bail. Bot. Bull.* xiii. Stems wiry, erect or trailing; the erect stems sometimes bearing adventitious tufts at the nodes, which soon disarticulate and falling upon the damp land take root and thus produce fresh plants; the trailing stems often extend a considerable distance and produce plants in a similar manner to the common Strawberry. The leaves of the erect stems are often quite filiform, but they are very thin and often 1 line broad on the trailing stems. The inflorescence is a very narrow, loose, spikelike panicle 2 to 4 in. long. Glumes narrow and nearly or quite transparent. The whole plant is pale-coloured.

Hab.: About the Diamantina and Georgina Rivers, where it is considered an excellent pasture grass.

Probably this and the var. *minor* of *S. virginicus* constitute the grass mentioned in *Fl. Austr.* vii. 621 as var. ? *pallida*, a name that could not now be used for a species, there being one already so named.

2. ***S. virginicus*** (of Virginia), *Kunth, Enum.* i. 210; *Benth. Fl. Austr.* vii. 621. Stems much branched and leafy at the base, erect or decumbent, 6 to 10 in. or rarely 1 ft. high. Leaves short and narrow, often very spreading, convolute when dry, rather rigid, glabrous or ciliate at the base. Panicle rather dense, narrow and spikelike or rather more branched at the base, 1 to 1½ in. long, often rather dark coloured. Glumes keeled, rather acute, about 1 line long, the 2 outer and the flowering one similar or the lowest rather smaller. Palea rather longer, the 2 nerves close together so as to represent a broad keel, but very readily splitting showing an inflexed margin between the nerves. Grain broadly obovoid, the very thin pericarp separable when soaked but undistinguishable in the dried state.—*Agrostis virginica*, Linn.; *Labill. Pl. Nov. Holl.* i. 20, t. 28; *R. Br. Prod.* 170; *Vilfa virginica*, Beauv.; *Trin. Spec. Gram.* t. 48.

S. virginicus proper is the stout-stemmed erect grass, with erecto-patent rather harsh leaves, found on the brackish marshy lands near the coast.

Var. *minor*, *Bail.*, is found in similar situations, but often further from the coast. Both have dark-green foliage and more or less running underground stems. The spike-like inflorescence is usually of a somewhat dark colour. Neither of these grasses will thrive far from brackish water, but in such localities they form excellent fattening pasture.

The species is widely spread over the warmer regions of the New and the Old World, extending into South Africa and North America.

3. ***S. indicus*** (of India), *R. Br. Prod.* 170; *Benth. Fl. Austr.* vii. 622. Rat's-tail Grass. "*Jilgrubari*," *Cloncurry, Roth.* An erect tufted grass of 1 to 2 ft., glabrous except a few cilia at the base of the leaves. Leaves chiefly at the base of the stem, narrow, ending in fine points, the upper ones few with long sheaths. Spikelike panicle narrow, 8 to 8 in. or even longer, usually continuous throughout. Spikelets very numerous, crowded along the very short.



F. Elliott, Lith.

Sporobolus Benthامي, Bail. Digitized by Google

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erect almost imbricate or distant branches. Outer glumes almost hyaline, obtuse, 1-nerved, the lowest about $\frac{1}{2}$ line, the 2nd $\frac{3}{4}$ line long; flowering glume about 1 line, of a firmer consistence, broad but almost tapering to a point, 1-nerved. Palea nearly as long, faintly 2-nerved. Grain broadly obovoid, the very thin pericarp sometimes appearing loose, though often evanescent or undistinguishable in the dried state.—Kunth, Enum. i. 211; Bail. Ill. Mono. Gr. Q. i.; Turner Austr. Gr. 52; Buch. In. Gr. N.Z. Pl. xviii.; *Sporobolus tenacissimus*, Beauv.; Kunth, Enum. i. 211; *Vilfa tenacissima*, Trin. Spec. Gram. t. 60; *V. capensis*, Beauv.; Trin. Spec. Gram. t. 56.

Hab.: Brisbane River, Moreton Bay, *F. v. Mueller*, *Bailey*, *C. Stuart*; Rockhampton and neighbouring districts, *Bowman*, *O'Shanesy* and others; Bowen Downs, *Birch*.

Grain used for food by Cloncurry natives.—*Palmer* and *Roth*.

The inflorescence infested with the fungus *Helminthosporium Ravenelii*, *Curt*.

Generally spread over tropical and subtropical America, Africa and Asia, extending also into Norfolk Island and New Zealand.

Var. *elongatus*. Stems and leaves much more slender than the type, and the inflorescence more elongated and interrupted. *S. elongatus*, R. Br. Prod., *S. tenacissimus*, Beauv.

Hab.: Same as normal form.

4. **S. diander** (2-stamens), *Beauv.*; *Kunth*, Enum. i. 213; *Benth. Fl. Austr.* vii. 622. An erect forming tussacs, glabrous grass of 1 to 2 or even 3 ft. Leaves chiefly at the base, narrow, the upper sheaths not covering the stem. Panicle narrow but loosely pyramidal, 6 in. to above 1 ft. long, the branches scattered, at length spreading. Spikelets very shortly pedicellate or almost sessile, $\frac{3}{4}$ to 1 line long. Outer empty glumes very obtuse; hyaline, the upper one about $\frac{1}{2}$ line, the other shorter. Flowering glume longer, slightly keeled, obtuse or almost acute. Palea broad, obtuse, faintly 2-nerved and not so readily splitting as in the other species. Stamens generally 3. Grain broadly obovoid, the pericarp not readily separable.—Turner Austr. Gr. 51; Bail. Ill. Mono. Gr. Q. i.; *Vilfa erosa*, Trin. Agrost. Vilf. 64.

Hab.: A southern river-side species.

Widely spread in East India.

5. **S. pulchellus** (pretty), *R. Br. Prod.* 170; *Benth. Fl. Austr.* vii. 623. Stems tufted, 6 in. to 1 ft. high. Leaves chiefly at the base, flat or keeled, broad or narrow, rather rigid, bordered by rigid cilia tuberculate at the base. Panicle loosely pyramidal, 2 to 5 in. long, with numerous capillary spreading branches verticillate at regular intervals. Spikelets pedicellate, not $\frac{1}{2}$ line long, shining. Glumes almost hyaline, rather obtuse, slightly keeled, the 2nd outer empty one and the flowering one nearly equal and similar, the lowest empty one about half as long, narrow but obtuse. Palea very readily splitting in two. Grain globular, enclosed in a loose hyaline pericarp.—Kunth, Rev. Gram. t. 123 (an unusually narrow-leaved form and the remarkable cilia are not represented); *Vilfa pulchella*, Trin. Agrost. Vilf. 37.

Hab.: Endeavour River, *Banks* and *Solander*; Kennedy district, *Daintree*; Elliot River, *Bowman*; Peak Downs, *Skater*.

6. **S. Lindleyi** (after Dr. J. Lindley), *Benth. Fl. Austr.* vii. 623. "Yak-kaberry," Cloncurry, *Palmer*; "Unkeelyinkeela," Georgina, *Coghlan*; "Yakkapari," Boulia, *Roth*. Nearly allied to *S. pulchellus*. Leaves narrow, not at all or only very shortly ciliate. Panicle very loose, broadly pyramidal, 3 to 5 in. long and broad when fully out, the branches capillary, the lower ones elongated in a dense verticil, the upper ones more scattered. Spikelets $\frac{1}{2}$ to $\frac{3}{4}$ line long. Glumes very acute, the lowest outer one very small and narrow, the 2nd also empty and the flowering glume nearly equal, usually dark coloured. Palea usually divided to the base into 2 even at the time of flowering. Seed enclosed

in a loose pericarp, as in *S. pulchellus*.—Turner Austr. Gr. 53; *S. pallidus*, Lindl. in. Mitch. Trop. Austr. 187, not of Nees; *Vilfa Lindleyi*, Stead. Syn. Glum. i. 162; *S. subtilis*, F. v. M. Fragm. viii. 140, not of Kunth.

Hab.: Maranoa, Mitchell; Bokhara Flats, Leichhardt; Gracemere, Bowman; Curriwillighie, Dalton.

Grain used for food by Cloncurry natives.—Palmer and Roth.

In general this species is very distant from *S. pulchellus*, both in foliage and in spikelets, but some specimens almost connect the two.

7. *S. actinocladius* (branches rayed), F. v. M. Fragm. viii. 140; Benth. Fl. Austr. vii. 628. "Coocheramunda," Georgina, Coghlan; "Katura," Boulia, Roth. Stems 1 to 2 ft. high. Leaves flat, tapering to fine points, glabrous. Panicle pyramidal, 3 to 5 in. long, the branches numerous, spreading, the lower ones or nearly all verticillate at regular intervals, the upper ones scattered, all capillary and shortly bare at the base, but bearing narrow dense spikelike partial panicles of $\frac{1}{2}$ to 1 in. Spikelets sessile and crowded, nearly 1 line long. Outer glume very small, hyaline, almost obtuse; 2nd very acute, keeled, $\frac{1}{2}$ to $\frac{3}{4}$ line long; flowering glume similar but longer. Palea divided into 2 from the base, even at the time of flowering. Seed enclosed in a loose pericarp.—Bail. Ill. Mono. Gr. Q. i.; *Vilfa* or *Agrostis actinoclada*, F. v. M. Fragm. vi. 84.

Hab.: A very common inland grass.

Grain used for food by Boulia natives.—Roth.

58. AGROSTIS, Linn. partly.

(From *agros*, a field; the Greek name for a kind of grass.)

(*Agrostis* and *Trichodium*, Nees.)

Spikelets small, 1-flowered, pedicellate in a loose spreading or narrow panicle, the rhachis of the spikelet articulate above the outer glumes, glabrous or nearly so, not produced beyond the flower. Glumes 3, 2 outer empty ones narrow, keeled, acute, unawned. Flowering glume shorter, broad, thin, enveloping the flower, unawned or with a dorsal awn, attached below the middle, fine and twisted. Palea not above half the length of the glume, very thin and hyaline, often very minute or none. Styles very short, distinct. Grain enclosed in the glume, free from it.

The genus as now limited is still very generally spread over the temperate and some warmer regions of both hemispheres.

1. *A. scabra* (rough), Willd. Spec. Pl. i. 370; Benth. Fl. Austr. vii. 576. Stems slender, tufted, 6 in. to above 1 ft. high. Leaves very narrow, almost filiform in the typical form, chiefly at the base of the stem. Panicle compound, very loose and slender, with spreading capillary branches. Outer glumes narrow, keeled, rather acute, about $\frac{3}{4}$ line long. Flowering glume shorter, hyaline, broad and enveloping the flower, obtuse truncate or slightly jagged, unawned. Palea none or very minute. Stamens 3.—*A. parviflora*, R. Br. Prod. 170; Hook. f. Fl. Tasm. ii. 113, t. 158; Buch. In. Gr. N.Z. Pl. xx. C.; *A. intricata*, Nees in Hook. Lond. Journ. ii. 413; *Trichodium laxiflorum*, Mich. Fl. Bor. Am. i. 42, t. 8; *Agrostis laxiflora*, Richards; Kunth, Rev. Gram. t. 180.

Hab.: Stanthorpe.

This has been identified by Munro with a common North American species which has a wide range and has been published under various names, of which Willdenow's has the right of priority, except perhaps a very inappropriate one of Fraser's.—Benth.

59. DEYEUXIA, Clarion.

(After Nicholas Deyeux.)

(*Bromidium*, Nees.)

Spikelets 1-flowered, pedicellate or rarely sessile in a panicle either loose and spreading or narrow and spike-like, the rhachis of the spikelet articulate above the outer glumes, usually bearing a tuft of hairs round the flowering glume, and

usually produced beyond it in a small ciliate or rarely glabrous bristle very rarely bearing an empty glume or imperfect flower, sometimes very minute, rarely deficient. Glumes 8, 2 outer ones persistent, keeled, unawned; flowering glume shorter and very thin, about as long or rarely longer and membranous, broad, enclosing the flower, 5-nerved, with a fine dorsal awn usually bent and twisted, rarely short and straight or very rarely deficient. Palea thin, more than half as long as the glume, faintly or prominently 2-nerved. Styles distinct, short. Grain enclosed in the glume and palea and sometimes partially adhering to them.

A considerable genus, spread over the warmer and temperate regions both of the New and the Old World.

Flowering glume very thin, almost hyaline, much shorter than the empty ones.

Panicle loose and spreading or in smaller plants narrow. Rhachis of the spikelet produced into a hairy bristle.

Spikelets $1\frac{1}{2}$ to 2 lines long. Flowering glume usually hairy truncate or shortly toothed, the awn about the middle. Panicle spreading

1. *D. Forsteri*.

Panicle dense and spikelike or shortly branched. Rhachis of the spikelet produced into a glabrous or minute bristle or not continued beyond the flower.

Spikelets $1\frac{1}{2}$ to 2 lines. Awn almost basal. Bristle of the rhachis minute or none

2. *D. quadriseta*.

Flowering glume nearly or quite as long as the outer ones, membranous, often minutely scabrous or pubescent.

Panicle very loose. Awn very small and straight above the middle of the flowering glume or reduced to a small point near the summit

3. *D. scabra*.

1. ***D. Forsteri*** (after J. R. Forster), *Kunth, Enum. i. 244*; *Benth. Fl. Austr. vii. 579*. A common grass, very variable in habit, usually erect or decumbent, 1 to 2ft. high or rather more, with flat rather flaccid leaves, but sometimes smaller with convolute or fine almost filiform leaves. Panicle usually very loose and spreading when fully out, 6in. to 1ft. long, with long capillary divided branches in distant whorls or clusters. Spikelets very numerous. Outer glumes narrow; very pointed, 1 to $1\frac{1}{2}$ lines long or in some varieties nearly 2 lines. Flowering glume about half as long, thin and almost hyaline, broad, enveloping the flower, truncate or very shortly and unequally 2 or 4-toothed, sprinkled or densely covered with hairs on the back, rarely almost glabrous, surrounded by the hairs of the rhachis, with a fine twisted awn attached about the middle of the back. Palea very narrow. Rhachis produced into a bristle usually very short and ciliate with a few long hairs.—*Bail. Ill. Mono. Gr. Q. i.*; *Turn. Ag. Gaz. N.S.W. ii.*; *Agrostis Forsteri*, *Rœm. and Schult. Syst. ii. 359*; *A. æmula*, *R. Br. Prod. 172*; *Hook. f. Fl. Tasm. ii. 115*; *Buch. Ind. Gr. N.Z. Pl. xxi.*; *A. retrofracta*, *Willd. Enum. Hort. Berol. 94*; *Lachnagrostis retrofracta*, *Trin. Fund. Agrost. 128*; *L. Willdenowii*, *Trin. Gram. Unif. 217*; *Calamagrostis æmula* and *C. Willdenowii*, *Steud. Syn. Glum. i. 192*; *Agrostis debilis*, *Poir. Dict. Suppl. i. 249* (from the descr. confirmed by Kunth); *A. Solandri*, *F. v. M. Veg. Chath. Isl. 60*; *A. semibarbata*, *Trin. in Mem. Acad. Petersb. series 6, vi. 378* (from the char. given).

Hab.: Warwick, *Beckler*; Darling Downs, *Woolfs*. Very common in southern localities.

This is a quick-growing grass, springing up with the slightest shower of rain, especially in winter.

2. ***D. quadriseta*** (4-bristled), *Benth. Fl. Austr. vii. 581*. A glabrous and smooth or scabrous erect perennial, very variable in stature, usually 1 to 8ft. high. Leaves narrow, erect or spreading, flat or convolute when dry. Panicle dense and spikelike, varying from $1\frac{1}{2}$ or 2in. to 8 or 10in. long, when small closely cylindrical, when large more branched, but the spikelets always densely crowded from the base of the short erect branches. Outer glumes narrow, very acute, with a scabrous or minutely ciliate keel, the sides smooth, $1\frac{1}{2}$ to near

2 lines long. Flowering glume shorter, broad hyaline and rolled round the flower, the 2 nerves on each side more or less produced into acute teeth or points. Awn attached much below the middle or close to the base, usually not much longer than the outer glumes. Palea narrow. Rhachis of the spikelet hairy round the flower, produced sometimes into a minute bristle which however appears to be generally deficient.—*Avena quadrisetata*, Labill. Pl. Nov. Holl. i. 25, t. 32; *Agrostis quadrisetata*, R. Br. Prod. 171; Trin. Spec. Gram. t. 88; Hook. f. Fl. Tasm. ii. 114; Buch. Ind. Gr. N.Z. xxvi.; *A. lobata*, R. Br. l.c.; *A. diaphora*, Trin. in Mem. Acad. Petersb. ser. 6, vi. 366; *Bromidium quadrisetum*, Nees in Hook. Lond. Journ. ii. 416; *B. lobatum*, Nees l.c. 415.

Hab.: Stanthorpe. Also in New Zealand.

3. ***D. scabra*** (rough), *Benth. Fl. Austr.* vii. 583. Stems usually weak and decumbent, 1 to 2ft. long. Leaves flat, flaccid. Panicle loose, varying from 2 to 8in., the capillary branches short, scattered or in twos or threes, distant in the longer panicles, few in the short ones, not very spreading. Outer glumes 1 to 1½ lines long, acute, keeled or the 2nd 3-nerved. Flowering glumes scarcely shorter or at length rather longer, membranous, rather stiff in fruit and minutely scabrous-pubescent, the awn minute and straight, attached far above the middle and usually not exceeding the glume. Palea almost as long, rather broad. Rhachis with few hairs and produced into a bristle minute and glabrous or longer and hairy.—*Agrostis scabra*, R. Br. Prod. 172; Hook. f. Fl. Tasm. ii. 116; t. 160; *A. rudis*, Roem. and Schult. Syst. ii. 860; *Calamagrostis rudis*, Steud. Syn. Glum. i. 192; *A. contracta*, F. v. M.; Herb. Hook. f. l.c. t. 161; *A. decipiens*, R. Br. Prod. 172; *Cinna decipiens*, Kunth, Enum. t. i. 207.

Hab.: Condamine River, Hartmann.

60. DICHELACHNE, Endl.

(Referring to the 2-lobed flowering glume.)

Spikelets 1-flowered, numerous in a narrow usually dense panicle, the rhachis of the spikelet articulate immediately above the 2 outer glumes and not continued beyond the flower. Glumes 3, acute, the 2 outer ones persistent, membranous, acute, keeled. Flowering glume raised on a short hairy stipes (rhachis of the spikelet), membranous at the time of flowering, hyaline and entire or 2-lobed at the end, with a fine scarcely twisted dorsal horn a little below the end slightly hardened round the fruit. Palea 2-nerved. Stamens 3 or fewer; anthers glabrous. Styles distinct. Grain enclosed in the glume and palea, free from them.

The genus is probably limited to the two Australian species which extend to New Zealand.

Panicle very dense, the awns above 1in. long, very numerous and concealing the spikelets

Panicle rather loose, the awns 6 to 8 lines long

1. *D. crinita*.

2. *D. sciurea*.

1. ***D. crinita*** (hairy), Hook. f. Fl. N. Zel. i. 298, *Fl. Tasm.* ii. 111; *Benth. Fl. Austr.* vii. 574. Long-haired Plume Grass. Stems 2 to 3ft. high. Leaves flat, glabrous or softly pubescent, the upper ones rather long with long sheaths. Panicle very dense and spikelike, 4 to 8in. long, the spikelets imbricate on the short erect branches but concealed by the numerous long hairlike awns. Outer glumes very narrow, hyaline with a slightly scabrous keel, nearly equal, about 2½ lines long. Flowering glume shorter, glabrous, the hyaline tip entire but readily splitting. Awn dorsal, very slender, bent but scarcely twisted, above 1in. long.—Buch. Ind. Gr. N.Z. Pl. xv.; Turner Ag. Gaz. N.S.W. ii.; Bail. Ill. Gr. Q. i.; *Anthoxanthum crinitum*, Linn. f. Suppl. 90; Labill. Pl. Nov. Holl. ii. 115, t. 268; *Agrostis crinita*, R. Br. Prod. 170; *Muehlenbergia crinita*, Trin.

Gram. Unifl. 193; *M. mollicoma*, Nees in Hook. Lond. Journ. ii. 414; *Dichelachne Hookeriana*, *D. Forsteriana*, *D. comata* and *D. longiseta*, Trin. and Rupr. Gram. Stip. 3 to 5 (from the descr. and references); also Sieb. Agrostoth. n. 86.

Hab.: Moreton Bay to Darling Downs. Common.

This is a quick-growing excellent pasture grass, and also makes good hay; it has the advantage over many others of producing good feed all the year round, for the least rain starts it into growth.

This grass has been recommended as a substance for the manufacture of tissue and thin wrapper paper.

2. *D. sciturea* (squirrel-tailed), Hook. f. Fl. N. Zel. i. 294, Fl. Tasm. ii. 111, t. 158 A.; Benth. Fl. Austr. vii. 574. Stems densely tufted, slender, 1 to 1½ rarely 2ft. high, quite glabrous, the nodes usually dark-coloured. Leaves short, chiefly at the base of the stem, scabrous-pubescent or glabrous. Panicle narrower and looser than in *D. crinita*, 3 to 6in. long, the rhachis and filiform branches scabrous. Outer glumes very narrow, about 2½ lines long, the outermost rather shorter than the 2nd. Fruiting glume rather more rigid than in *D. crinita* and minutely pitted-rugose. Awns 6 to 8 lines long, not nearly so crowded as in that species.—Buch. Ind. Gr. N.Z. Pl. xv.; Turner Ag. Gaz. N.S.W. ii.; *Agrostis sciturea*, R. Br. Prod. 171; Sieb. Agrostoth. n. 68; *Muehlenbergia sciturea*, Trin. Gram. Unifl. 193; *Agrostis rara*, Nees in Sieb. l.c. n. 70; *Dichelachne Sieberiana* and *D. vulgaris*, Trin. and Rupr. Gram. Stip. 2, 3; *D. montana*, Endl. Prod. Fl. Norf. 20 (from the character as revised by Trinius Gram. Stip. 1).

Hab.: Southern localities. Rare.

The species is also in New Zealand and in Norfolk Island.

61. ERIACHNE, R. Br.

(Referring to the glumes being hairy.)

Spikelets 2-flowered, usually not very numerous, in a loose or dense panicle, the flowers both hermaphrodite and similar, the rhachis of the spikelet articulate above the outer glumes and hairy round the flowering ones. Empty glumes 2. persistent, acute or tapering into a point or short awn, many (usually 9 to 11) nerved. Flowering glumes with fewer nerves, with long spreading hairs on the back or margins, awnless or tapering into a fine straight or curved awn not twisted. Palea very flat, often hairy on the back, with 2 prominent almost marginal nerves. Styles distinct, short. Grain more or less flattened, enclosed in the glume and palea, free from them.

Besides the Australian species, which are mostly endemic, there are others in South Africa and tropical Asia.

Awns much longer than the glumes. Panicle dense. Spikelets sessile or nearly so.

Palea produced into 2 fine awn-like points.

Outer glumes glabrous, nearly 4 lines long. Awn above 1in. long . . . 1. *E. stipacea*.

Outer glumes hairy, 2 to 2½ lines long. Awns scarcely 1in. . . . 2. *E. Armitii*.

Palea-point short, entire or minutely notched.

Nodes densely bearded. Outer glumes hairy, nearly 4 lines long. Awn about 1in.

Nodes glabrous. Outer glumes hairy, about 2 lines long. Awn under ½in. . . . 3. *E. squarrosa*.

Nodes glabrous. Outer glumes hairy, about 2 lines long. Awn under ½in. . . . 4. *E. glauca*.

Awns much longer than the glumes. Panicle loose, with few pedicellate spikelets. Leaves narrow, hispid with spreading hairs.

Outer glumes glabrous, 2½ to 3 lines long 5. *E. rara*.

Awns not longer than the glumes. Panicle loose. Spikelets pedicellate usually few.

Leaves narrow, hispid with spreading hairs. Small slender plants.

Outer glumes 1½ line, glabrous 6. *E. ciliata*.

Leaves glabrous.

Leaves subulate. Outer glumes glabrous, about 4 lines long. Flowering glumes ciliate only 7. *E. avenacea*.

Leaves flat. Outer glumes hairy, about 4 lines long. Flowering glume hairy all over 8. *E. aristidea*.

Leaves narrow. Outer glumes glabrous, scarcely $1\frac{1}{2}$ line long. Panicle very loose, with long branches and pedicels 9. *E. pallescens*.

Awn none or reduced to a very small point.

Panicle narrow. Spikelets pedicellate. Outer glumes about 3 lines long.

Tall plant, with glabrous flat leaves 10. *E. pallida*.

Panicle loose or reduced to 2 or 3 spikelets. Outer glumes not above 2 lines long.

Leaves not pungent, the upper ones distant. Spikelets about 2 lines long.

Flowering glumes mucronate 11. *E. mucronata*.

Flowering glumes obtuse or scarcely acute 12. *E. obtusa*.

1. ***E. stipacea*** (Stipa-like), *F. v. M. Fragm.* v. 206; *Benth. Fl. Austr.* vii. 627. Stems 2 or 3 ft. high, the nodes bearded, otherwise glabrous. Leaves narrow, flat. Panicle secund, rather dense, 4 to 5 in. long, Spikelets narrow, not numerous, nearly sessile along the branches. Outer glumes about 4 lines long, glabrous, tapering to a fine point and produced into a straight awn, sometimes nearly half as long as the glume. Flowering glumes shortly hairy all over, with a slender curved awn about $1\frac{1}{2}$ in. long. Palea flat, tapering to a point divided into 2 awns nearly as long as the palea itself.

Hab.: Cape York, *Daemel*.

2. ***E. Armitii*** (after W. E. Armit), *F. v. M. Herb.*; *Benth. Fl. Austr.* vii. 627. Stems 6 in. to 1 ft. high or rather more, the nodes slightly bearded. Leaves narrow, convolute. Panicle dense, $1\frac{1}{2}$ to 2 in. long, the rachis slightly hirsute. Spikelets sessile on the short branches. Outer glumes 2 to $2\frac{1}{2}$ lines long, more or less sprinkled with spreading hairs arising from tubercles, tapering into awn-like points shorter than the glume. Flowering glumes shorter, densely hairy all over, with a fine awn usually about 1 in. long. Palea tapering into 2 fine awn-like points a little shorter than the glume itself.

Hab.: Gilbert River, *Armit*; Norman River, *Gulliver*.

3. ***E. squarrosa*** (sugarrose), *R. Br. Prod.* 183; *Benth. Fl. Austr.* vii. 628. Stems erect, 2 ft. high or more, the nodes densely bearded with long silky hairs. Panicle dense, 2 to 4 in. long. Spikelets sessile and crowded along the short erect or slightly spreading branches. Outer glumes nearly 4 lines long, tapering to a fine point, hispid with long rigid spreading hairs. Flowering glumes nearly as long, narrow, hairy outside, tapering into an awn of about 1 in. Palea tapering into a short entire point.—*Aira squarrosa*, Spreng. Syst. i. 272.

Hab.: Endeavour River and Bustard Bay, *Banks and Solander*.

4. ***E. glauca*** (gray), *R. Br. Prod.* 184; *Benth. Fl. Austr.* vii. 628. Erect, 1 to 2 ft. high, glabrous and glaucous, the nodes not bearded. Leaves narrow, rather long. Panicle dense, 2 to 4 in. long. Spikelets sessile and crowded along the short erect or slightly spreading branches. Outer glumes about 2 lines long, more or less hairy outside, acute but not awned, faintly nerved. Flowering glumes about as long, sprinkled with hairs outside, the fine awn under $\frac{1}{2}$ in. long. Palea tapering into an entire or slightly notched point.—*Kunth, Rev. Gram.* t. 64; *Aira lavis*, Spreng. Syst. i. 278.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*.

5. ***E. rara*** (thinly set), *R. Br. Prod.* 183; *Benth. Fl. Austr.* vii. 628. Stems slender, scarcely 1 ft. high, the nodes bearded. Leaves very narrow, crowded at the base of the stem, hispid with short spreading hairs. Panicle short, loose, rather secund. Spikelets few, on slender pedicels. Outer glumes acutely

acuminate, $2\frac{1}{2}$ to 3 lines long, glabrous and dark-coloured. Flowering glume shorter, hairy all over, tapering into a slender awn nearly lin. long. Palea tapering into a fine bifid point.—*Aira rara*, Spreng. Syst. i. 278.

Hab.: Shoalwater Bay, *R. Brown*.

6. *E. ciliata* (ciliate), *R. Br. Prod.* 184; *Benth. Fl. Austr.* vii. 629. Slender decumbent and much branched, the stems ascending to 1ft. in some specimens, under 6in. in others. Leaves chiefly at the base, short, narrow, fine pointed, spreading, more or less hirsute with rigid spreading hairs. Panicle loose, with capillary branches and pedicels. Spikelets few. Outer glumes nearly $1\frac{1}{2}$ line long, glabrous, thin, acute. Flowering glumes not longer, more acute, with a fine awn nearly as long as themselves, hirsute outside. Palea ciliate outside. Stamens 3. Grain much flattened.—*Aira ciliata*, Spreng. Syst. i. 278.

Hab.: Between Norman and Gilbert Rivers, *Gulliver*; Broadsound, *R. Brown* (rather smaller, the panicle rather more dense.—*Benth*).

7. *E. avenacea* (Oat-like), *R. Br. Prod.* 184; *Benth. Fl. Austr.* vii. 629. Stems usually about 1ft. high, slender, the nodes slightly bearded or rarely glabrous. Leaves very fine, subulate, erect, chiefly at the base of the stem. Panicle loose, nearly simple or with few capillary branches bearing 2 or 4 pedicellate spikelets. Outer glumes usually about 3 lines long, very acute or shortly pointed, prominently-nerved, glabrous. Flowering glumes glabrous on the back except at the base, the margins ciliate with long hairs, tapering into an awn much shorter than the glume itself. Palea slightly hairy, acutely acuminate. *Aira avenacea*, Spreng. Syst. i. 278.

Hab.: Walsh's Pyramid and Mulgrave River, a form with the stems attaining 2ft. in height.

8. *E. aristidea* (Aristida-like). *F. v. M. Fragm.* v. 205; *Benth. Fl. Austr.* vii. 629. Stems branching and often decumbent at the base, ascending to from $\frac{1}{2}$ to $1\frac{1}{2}$ ft., the nodes usually bearded. Leaves flat, glabrous, the sheaths often broad. Panicle loose, with few spreading branches. Spikelets shortly pedicellate. Outer glumes usually purplish, about 4 lines long, acute, sprinkled with spreading hairs arising from tubercles. Flowering glumes densely silky-hairy except at the top, tapering into an awn scarcely so long as the glume itself. Palea hairy, tapering into a deeply bifid awnlike point.

Hab.: Bowen Downs, *Birch*.

9. *E. pallescens* (pale), *R. Br. Prod.* 184; *Benth. Fl. Austr.* vii. 630. Stems slender, branching, 1 to $2\frac{1}{2}$ ft. high, the nodes glabrous. Leaves very narrow, glabrous or slightly ciliate at the base. Panicle very loose, with long capillary branches and pedicels. Spikelets scarcely $1\frac{1}{2}$ line long. Outer glumes glabrous, acute. Flowering glumes hairy outside and ciliate, tapering into an awn nearly as long as the glume itself. Palea entire.—*Aira effusa*, Spreng. Syst. i. 278; *Eriachne chinensis*, Hance in Ann. Sc. Nat. ser. 4, xv. 228, and in Journ. Linn. Soc. xiii. 186.

Hab.: Endeavour River, *Banks and Solander*; Sandstone ridges near Rockhampton, *O'Shanesy*.

Also in the eastern provinces of India and in South China.

10. *E. pallida* (pale), *F. v. M. Herb.*; *Benth. Fl. Austr.* vii. 631. Stems apparently about 2ft. high, slender and branching. Leaves flat but narrow, with subulate points, glabrous. Panicle loose but narrow, 2 to 4in. long, the spikelets all pedicellate. Outer glumes glabrous, about 3 lines long, tapering into fine points. Flowering glumes longer, with fine points, but scarcely awned, glabrous on the back except near the base, the margins ciliate with long hairs. Palea hairy, tapering to a fine bifid point.

Hab.: Recorded for Queensland by *F. v. M.*

11. ***E. mucronata*** (mucronate), *R. Br. Prod.* 184; *Benth. Fl. Austr.* vii. 632. Stems very slender but rigid, about 1 ft. high. Leaves short, spreading, subulate, with fine points, the lower sheaths sprinkled with rigid hairs or glabrous, the upper ones distant. Panicle rather loose, 1 to 1½ in. long, of few spikelets closely resembling those of *E. obtusa*, but rather larger, and the flowering glumes tipped with short points exceeding the outer glumes.—*E. brevifolia*, *R. Br. l.c.*; *Aira mucronata*, *Spreng. Syst.* i. 276.

Hab.: Endeavour River, *Banks and Solander*; Dunrobin and other localities near Rockhampton, *O'Shanesy, Thozet*.

12. ***E. obtusa*** (obtuse), *R. Br. Prod.* 184; *Benth. Fl. Austr.* vii. 632. A variable grass, usually 1 to 2 ft. high, often branched in the lower part. Leaves narrow, flat or subulate, glabrous or the lower sheaths sprinkled with rigid hairs. Panicle loose, sometimes much branched and 4 in. long, sometimes almost reduced to a raceme of half-a-dozen spikelets. Spikelets ovoid, about 2 lines long, appearing acute when young, assuming the obtuse aspect when in fruit. Outer glumes membranous, acute, with fewer nerves than most species (usually 5), sprinkled on the back and ciliate with a few long hairs, rarely quite glabrous. Flowering glumes about as long, more obtuse, rarely with a minute point, densely ciliate to the top and sprinkled on the back with spreading hairs. Pale entire, slightly hairy. Grain much flattened.—*Turner Ag. Gaz. N.S.W.* ii.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown, Henne*; Endeavour River, *A. Cunningham*; King's Creek, *Bowman*; Springsure, *Wuth.* Common on Downs country.

62. MICRAIRA, F. v. M.

(Small *Aira*; resemblance of plant.)

Spikelets 2-flowered, the flowers both hermaphrodite or the lower male, all small, in small loose panicles with filiform spreading branches, the rhachis of the spikelet articulate above the empty glumes and not produced above the flowering ones. Glumes awnless, 2 outer empty ones equal, membranous, broadly lanceolate, faintly nerved. Flowering glumes close above the empty ones, equal, broad, truncate many-nerved, membranous. Palea several-nerved but 2 of the nerves very prominent. Styles distinct, with short stigmas. Fruiting glumes and palea enclosing the grain but not hardened.

The genus is limited to the Australian species, which is endemic.

1. ***M. subulifolia*** (leaves awl-shaped), *F. v. M. Fragm.* v. 208; *Benth. Fl. Austr.* vii. 624. Mountain Couch. A glabrous prostrate or creeping perennial, with short ascending branches, covered at the base with the short broad closely imbricate sheaths of old leaves. Leaves in short dense tufts at the ends of the branches, linear-subulate, erect, under ½ in. long, the ligula split into cilia. Peduncles from the tufts erect, filiform, 1 to 2 in. long, encased at the base in 2 or 3 long narrow leaf-sheaths. Panicle broad and loose, ½ in. long or rather more, with capillary spreading slightly divided branches. Spikelets pedicellate, scarcely above ½ line long, usually dark-coloured, glabrous. Outer glumes as long as the flowering ones.

Hab.: Glasshouse Mountains, *W. Hill*; Rockingham Bay, *Dallachy*; on rocks sometimes completely covering them with a dense springy turf.

63. CÆLACHNE, R. Br.

(Referring to the hollow glumes.)

Spikelets 2-flowered, the upper one usually female, the lower one hermaphrodite, all small in loose or narrow panicles, the rhachis of the spikelet glabrous, articulate, produced between the 2 flowering glumes, but not beyond them.

Glumes unawned, convex, 2 outer empty ones broad, faintly nerved, the 3rd or lowest flowering glume close above them and similar but larger. Terminal flowering glume raised on the slender rhachis, smaller than the 3rd. Paleas as long as the glume. Styles short, distinct, with short stigmas. Fruiting glumes and paleas scarcely hardened, not closed over the grain.

A small genus, spread over tropical Asia, the only Australian species extending to the Malayan Peninsula and India

1. **C. pulchella** (pretty), *R. Br. Prod.* 187; *Benth. Fl. Austr.* vii. 626. A weak slender decumbent glabrous grass, rarely ascending to 6in. Leaves flat, lanceolate or almost linear, flaccid but strongly nerved, under 1in. long. Panicle narrow but loose, 1 to 8in. long, the rhachis and short spreading branches filiform. Spikelets mostly pedicellate, scarcely $\frac{1}{2}$ line long. Outer empty glumes almost orbicular, faintly 8-nerved, the 3rd or lowest flowering glume twice as long as the outer ones, and close above them; rhachis between the flowering glumes as long as the outer glumes. Anthers small. Grain small and narrow.—Kunth, *Rev. Gram.* t. 148.

Hab.: Eudeavour River, *Banks and Solander, A. Cunningham.*

64. *HOLCUS, Linn.

(*Holkos*, the old Greek name of a grass.)

(From the supposed power of the original plant in extracting thorns.)

Spikelets 2-flowered, numerous and crowded in an open panicle, the lower flower hermaphrodite, the upper one male, the rhachis glabrous and produced above the outer glumes. Outer empty glumes 2, nearly equal, complicate, keeled, awnless, enclosing the flowers. Flowering glumes shorter, the lowest awnless, the upper one with a short dorsal twisted awn.

The genus is limited to two species, spread over the temperate regions of the northern hemisphere in the Old World, of which one has now become naturalised in Australia as in South Africa.

1 **H. lanatus** (woolly), *Linn.*; *Kunth, Enum.* i. 34; *Benth. Fl. Austr.* vii. 586. A perennial grass, with a creeping rhizome and ascending stems of 1 to 2ft., more or less clothed as well as the leaves with a very short pubescence, which gives the whole plant a pale soft appearance. Panicle 2 to 8in. long, pale or occasionally somewhat darker coloured. Outer glumes about 2 lines long, rather obtuse, the awn of the upper flowering glume rarely reaching their length.—*Reichb. Ic. Fl. Germ.* t. 105; *F. v. M. Fragm.* viii. 126.

Hab.: Darling Downs. Naturalised.

65. *AVENA, Linn.

(Derivation obscure.)

Spikelets few-flowered, in a loose panicle, the rhachis articulate above the 2 outer glumes, hairy under the flowering glumes. Glumes scarious, at least at the top, the 2 outer empty ones lanceolate, tapering to a point; flowering glumes smaller, shortly 2-cleft at the top, with a long dorsal twisted awn, the terminal glume often small and empty or rudimentary. Styles distinct. Grain pubescent or hairy, frequently adhering to the palea. Seed deeply furrowed.

A considerable genus widely spread over the temperate and cooler regions of the world, but represented in Australia only by an introduced weed.

1. **A. fatua** (insipid), *Linn.*; *Kunth, Enum.* i. 802; *Benth. Fl. Austr.* vii. 588. Wild Oat. An erect glabrous annual, 2 or 8ft. high, with a loose panicle of large spikelets hanging from filiform unequal pedicels, arranged in alternate branches along the main axis. Outer glumes nearly $\frac{1}{2}$ in. long.

Flowering glumes 2 or 3, scarcely so long, of a firm texture at the base, and covered outside with long brown hairs. Awn fully twice as long as the spikelet, twisted at the base, abruptly bent about the middle. Ovary hairy.

Hab.: Naturalised in many southern localities.

A common weed of cultivation in all corn countries, probably a native of the east Mediterranean region.

66. DANTHONIA, DC.

(After M. Danthoine.)

Spikelets several-flowered, pedicellate or rarely almost sessile, in a panicle either loose or reduced to a single raceme, the rhachis of the spikelet articulate above the outer glumes, hairy round the flowering ones. Outer empty glumes 2, narrow, keeled, acute, unawned, usually as long as the spikelet. Flowering glumes convex at the back, usually 9-nerved, with 2 rigid or scarious terminal lobes more or less 1 or 3-nerved at least at the base, and a twisted and bent awn between them. Palea broad, as long as or usually longer than the entire part of the glume, obtuse or 2-pointed. Styles distinct. Ovary glabrous. Grain free.

The genus extends over New Zealand, South Africa and the temperate regions of the northern hemisphere, with a very few tropical species in Africa, Asia and America.

SECT. I. **Monachathera**.—Panicle almost reduced to a raceme or very short. Flowering glumes with a broad obliquely turbinate hard base and ciliate with long hairs, the awn shorter or scarcely longer than the lobes.

Spikelets distant, in an almost simple raceme. Lobes of the flowering glumes lanceolate, 2 or 3 times as long as the base 1. *D. bipartita*.

SECT. II. **Eudanthonia**.—Flowering glume ovoid or oblong at the base, scarcely oblique, ciliate at least at the base. Awn longer than the lateral lobes.

Panicle loose. Spikelets numerous. Hairs of the flowering glume marginal and scattered or in longitudinal series on the back; lateral lobes acute or scarcely awned 2. *D. pallida*.

Panicle rather dense. Flowering glumes very small, with copious long hairs, lateral lobes very short long awns. Leaves long and filiform 3. *D. longifolia*.

Panicle narrow or dense. Flowering glumes oblong, with long marginal cilia but very few hairs on the back.

Stems under 2ft. high. Leaves narrow. Panicle reduced to a single raceme or the lower pedicels with two spikelets 4. *D. racemosa*.

Stems under 2ft. high. Leaves very narrow. Panicle dense 5. *D. pilosa*.

Panicle dense or rather loose. Flowering glumes oblong, with a ring of long hairs at or below the base of the lobes. Outer glumes not much exceeding the spikelet. Leaves narrow but not setaceous 6. *D. semiannularis*.

1. ***D. bipartita*** (2-parted), *F. v. M. Fragm.* i. 160; *Benth. Fl. Austr.* vii. 592. Stems from an almost bulbous often woolly base 1 to 2ft. high. Leaves flat but narrow, glabrous or sprinkled with long hairs. Panicle almost reduced to a simple raceme of 3 to 6in. Spikelets few, on short erect distant pedicels, or the lower pedicels shortly branched, with 2 or 3 spikelets. Outer glumes herbaceous, many-nerved, 5 to 8 lines long, tapering into fine points. Flowering glumes 4 to 8, scarcely exceeding the outer ones, the oblique base a little more than 1 line long and broad, with a dense ring of long hairs under the lobes. Lobes narrow-lanceolate, very acute, unawned, 3 to 4 lines long, the central awn scarcely longer. Palea obtuse or truncate.—*Monachather paradoxus*, Steud. *Syn. Glum.* i. 247.; *Turner Ag. Gaz. N.S.W.*, ii.

Hab.: Southern localities.

2. ***D. pallida*** (pale coloured), *R. Br. Prod.* 177; *Benth. Fl. Austr.* vii. 592. White-topped Grass. Stems 2ft. high or more, often rigid but not stout. Leaves long, terete when dry, very narrow, and sometimes as slender as in *D. longifolia*, the sheaths more or less ciliate at the orifice. Panicle usually

loosely-branched, pale-coloured, 3 to 6 in. long. Spikelets rather numerous, the outer glumes under $\frac{1}{2}$ in. long. Flowering glumes 3 or 4, not exceeding the outer ones, with long hairs on the back as well as on the margins, but scattered or in vertical lines, without the transverse ring of *D. semiannularis*; lateral lobes lanceolate, 3-nerved at the base, often scarious upwards, but the central nerve continued to the apex or produced into a point or a short awn.—Trin. Spec. Gram. t. 65; Sieb. Agrostoth. n. 81, 85, 92.

Hab.: Southern localities. Always affording good pasture.

Var. *subracemosa*. Panicle narrow, very little branched. Marginal hairs of the flowering glumes copious, those on the back less so than in the typical form.

Hab.: Warwick, *Beckler*.

3. ***D. longifolia*** (leaves long), *R. Br. Prod.* 176; *Benth. Fl. Austr.* vii. 593. Stems densely tufted, 1 to 2 ft. high. Leaves long and filiform, often rather rigid and curved, quite glabrous, without any cilia at the orifice of the sheath. Panicle dense, pale-coloured, ovate or narrow, 3 to 4 in. long. Outer glumes exceeding the spikelet, 4 to 6 lines long. Flowering glumes 3 to 5, very short, almost covered with soft hairs, the upper ones very long, the 2 lobes broad and short, usually with long awns, very fine as well as the longer central one.—Sieb. Agrostoth. n. 83.

Hab.: Upper Brisbane River, *R. v. Mueller*; and other southern localities.

A good pasture grass, especially on rich land.

4. ***D. racemosa*** (racemose), *R. Br. Prod.* 177; *Benth. Fl. Austr.* vii. 594. Stems slender, 1 to 2 ft. high. Leaves very narrow, almost setaceous, glabrous or sprinkled with spreading hairs. Spikelets in the typical form singly and very shortly pedicellate or almost sessile and rather distant along the rachis of a simple raceme, but sometimes more approximate and the lower pedicels with 2 spikelets. Spikelets narrow, erect, under $\frac{1}{2}$ in. long, the outer glumes nearly as long. Flowering glumes 6 to 8, or more in some varieties, hairy at the base and margins, glabrous or with very few hairs on the back, but the hairs variable, the marginal ones sometimes long in a dense tuft on each side of the lobes, sometimes in several distinct marginal tufts. Lateral lobes in the typical form broad with short fine points, but more awned in some varieties.

Hab.: Darling Downs to Wallangarra. A good sheep pasture grass.

Var. *obtusata*, *F. v. M.* A smaller plant. Leaves more hairy. Lateral lobes of the flowering glumes with scarcely any points. Hab.: Inland southern localities.

Var. *biaristata*. Lateral lobes of the flowering glumes broad, but with rather long points or awns. Hab.: Inland southern localities.

Var. *multiflora*. Spikelets often 2 together and all approximate. Flowers rather numerous in the spikelet. Hab.: Inland southern localities.

Hab.: Warwick, *Beckler*; Darling Downs and other southern localities.

5. ***D. pilosa*** (pilose), *R. Br. Prod.* 117; *Benth. Fl. Austr.* vii. 514. Stems rather slender, 1 to 2 ft. high. Leaves chiefly in radical tufts, very narrow, usually more or less hairy, the hairs sometimes long and spreading. Panicle narrow and dense, not much branched and sometimes almost as simple as in *D. racemosa*. Spikelets shortly pedicellate, about $\frac{1}{2}$ in. long, the outer glumes about as long; flowering glumes 6 to 8 with lanceolate lobes tapering into fine awns almost as in *D. semiannularis*, but hairy on the margins only, without the transverse ring under the lobes of that species, and very few hairs if any on the back except at the base.—Hook. f. *Fl. Tasm.* ii. 120; Sieb. Agrostoth. n. 57; Buch. Ind. Gr. N.Z., Pl. xxxiii.

Hab.: Southern localities.

An excellent pasture grass which, like others of the genus, seeds freely, and gives good feed in early spring.

6. ***D. semiannularis*** ($\frac{1}{2}$ -ringed), *R. Br. Prod.* 177; *Benth. Fl. Austr.* vii. 595. New Zealand Oat Grass. A variable plant, the stems usually 2 to 3 ft. high, but sometimes much shorter. Leaves very narrow, flat or convolute, the

sheaths glabrous or hairy, more or less ciliate at the orifice. Panicle sometimes loose and spreading, more frequently narrow and compact. Outer glumes acute, above $\frac{1}{2}$ in. and sometimes nearly 1 in. long. Flowering glumes usually 4 to 8, not exceeding the outer ones, the lobes lanceolate, with a broad or narrow hyaline margin, acute or tapering into a point or rather short fine awn, the long hairs or cilia copious at the base and margins and forming a ring round the back immediately under the lobes, the twisted awn varying from $\frac{1}{2}$ to 1 in. Palea longer than the entire base of the glume, often 2-pointed.—Hook. f. Fl. Tasm. ii. 120; Trin. Spec. Gram. t. 52; Buch. Ind. Gr. N.Z. Pl. xxxiv.; Turn. Ag. Gaz. N.S.W. i.; *Arundo semiannularis*, Labill. Pl. Nov. Holl. i. 26, t. 88; *D. varia*, Nees in Pl. Preiss. ii. 108; *D. setacea*, Hook. f. Fl. Tasm. ii. 121, not of R. Br.; *D. eriantha*, Lindl. in Mitch. Three Exped. ii. 807.

Hab.: Darling Downs.

An excellent grass for pasture or hay, considered one of the most nutritious of the native grasses, producing feed during winter and early in spring.

67. ANISOPOGON, R. Br.

(Unequal-bearded.)

Spikelets 1-flowered, large, in a loose but scarcely branched panicle, the rhachis of the spikelet articulate above the two outer glumes and produced into a slender bristle above the flower occasionally bearing an imperfect spikelet. Glumes 3, the two outer herbaceous; flowering glume raised on a short stipes (the rhachis of the spikelet), narrow, convolute, hard, with 3 rigid awns between 2 small hyaline terminal lobes, the central awn long twisted and bent. Palea hard, ending in a long rigid 2-nerved point. Styles distinct. Ovary crowned by a tuft of hairs.

Besides the Australian species which is endemic, there is one from South Africa.

1. *A. avenaceus* (Oat-like), R. Br. Prod. 176; Benth. Fl. Austr. vii. 590. An erect glabrous grass of 2 or 3 ft., branching at the base only. Leaves convolute, terminating in subulate points; ligula very short, truncate, often ciliate. Panicle long, the large spikelets hanging from slender pedicels. Outer glumes narrow, about 9-nerved, $1\frac{1}{2}$ to 2 in. long. Flowering glume about $\frac{1}{2}$ in. long, the central awn $2\frac{1}{2}$ to 3 in. long, the lateral ones finer and not half so long. Palea longer than the entire part of the glume. Lodicules long and lanceolate. Terminal barren spikelet when present small and silky-villous.—Beauv. Agrost. t. 9, f. 8; Kunth, Rev. Gram. t. 62; Sieb. Agrostoth. n. 56; Maid. Gr. N.S.W. 182; *Deyeuxia avenacea*, Spreng. Syst. i. 254; *Danthonia anisopogon*, Trin. Spec. Gram. t. 61.

Hab.: Queensland, F. v. M.

68. CYNODON, Pers.

(Literally "Dog-tooth"; doubtful how applied.)

Spikelets 1-flowered, awnless, singly sessile in 2 rows on one side of slender spikes, digitate at the end of the peduncle, the rhachis of the spikelet articulate immediately above the outer glumes, and either not produced beyond the flower or continued into a minute point behind the palea. Outer empty glumes 2, keeled, persistent or deciduous. Flowering glume broader, boat-shaped, with a prominent keel. Palea narrow or rather broad, the 2 nerves prominent, distant or closely contiguous. Grain smooth, enclosed in the glume and palea, but free from them.

A genus of very few species.

Flowering glume longer than the outer ones. Palea folded, with a small bristle or point behind it

1. *C. dactylon*.



F. Elliott, Lith.

Cynodon tenellus, R. Br.

Govt. Printing Office, Brisbane.



Cynodon convergens, F.v.M.
GOVT. PRINTING OFFICE, BRISBANE.

F. E. Elliott, Litt.

Flowering glume much shorter than the outer ones, and no point behind it.

Flowering glume pubescent. Palea with 2 prominent distant nerves. . . . 2. *C. tenellus*.

Flowering glume ciliate with long hairs on the keel and margins. Palea very narrow, the 2 nerves closely contiguous, forming a ciliate keel . . . 3. *C. convergens*.

1. ***C. dactylon*** (finger-like), *Pers.*; *Kunth, Fnum.* i. 259; *Benth. Fl. Austr.* vii. 609. Couch Grass. Stems prostrate, often creeping and rooting to a great extent, or forming running stems below the surface, the flowering branches shortly ascending or erect. Leaves short, sometimes of a glaucous green. Spikes 2 to 5, often purplish, from the numerous anthers being that colour, 1 to 2 in. long. Spikelets sessile, outer glumes narrow, acute, persistent, keeled, under 1 line long. Flowering glume rather above 1 line long, broadly boat-shaped, the keel usually minutely ciliate. Palea narrow. Rhachis of the spikelet produced into a point or bristle shorter than the glume, and often very minute.—*R. Br. Prod.* 187; *F. v. M. Fragm.* viii. 113; *Reichb. Io. F. Germ.* t. 26; *Turner Ag. Gaz. N.S.W.* ii.; *Panicum dactylum*, *Linn.*; *Sibth. Fl. Gr.* t. 60.

Hab.: Port Curtis, *McGillivray*; Moreton Bay, *F. v. Mueller* and others; Rockhampton and neighbouring districts, *O'Shanesy*, *Thozet*, *Bowman*. Common.

A very productive pasture grass; also excellent for lawns.

2. ***C. tenellus*** (slender), *R. Br. Prod.* 187; *Benth. Fl. Austr.* vii. 609. Stems creeping and rooting at the base as in *C. dactylon*, but usually much longer. Leaves narrow, rather long. Spikes slender, 3 to 6, digitate, 3 to 4 in. long. Outer glumes about 1 line long, narrow, rather obtuse, with a prominent ciliate keel. Flowering glume shorter and not broader, obtuse, pubescent, the rhachis of the spikelet not produced behind it.—*C. altior*, *F. v. M. Fragm.* viii. 113.

Hab.: Gulf country.

3. ***C. convergens*** (converged), *F. v. M. Fragm.* viii. 113; *Benth. Fl. Austr.* vii. 610. A decumbent or creeping grass with the habit of *C. dactylon* or in many specimens shortly erect, apparently without stolones, glabrous except a few hairs at the orifice of the sheaths. Spikes 3 or rarely only 2, 1 to 1½ in. long, the rhachis flat and rather broad; spikelets normally in 2 rows but alternately curved inwards so as to appear almost uniseriate. Outer glumes 1½ to nearly 2 lines long, narrow, glabrous, the green keel prominent and sometimes bearing a narrow whitish wing, the glumes much less persistent than in the other species. Flowering glume about half as long thin and hyaline ciliate on the keel and margins with long hairs. Palea very narrow, the two nerves closely contiguous and almost consolidated into a single one, ciliate with long hairs, the rhachis of the spikelet not produced behind it.

Hab.: Norman River, *T. Gulliver*.

Said to form good pasture.

69. CHLORIS, Linn.

(Green, referring to the color of the herbage.)

Spikelets 1-flowered, awned, singly sessile in 2 rows on one side of simple spikes, either solitary or digitate at the end of the peduncle, the rhachis of the spikelet articulate immediately above the outer glumes. Outer empty glumes 2, keeled, persistent, awnless. Flowering glume produced into a fine straight awn, entire or with a tooth lobe or short awn on each side of the terminal awn. Palea folded or with 2 prominent nerves. Rhachis of the spikelet produced behind the palea and bearing 1 or more empty glumes, all awned and usually with their ends on a level with that of the flowering glume.

A rather large genus, widely spread over the warmer regions of the globe.

Spike solitary, slender. Flowering glume narrow 1. *C. unispicea*.

Spikes digitate, slender. Spikelets acute. Flowering glume usually with a tooth lobe or short awn on each side of the terminal one.

Spikes few, about 1 in. long. Lobes of the flowering glume awned . . . 2. *C. pumilio*.

- Spikes numerous, 2 to 3 in. long. Spikelets closely approximate and regularly pectinate. Flowering glume 2-fid, unawned, usually scabrous 3. *C. pectinata*.
- Spikes 6 to 12 or more, 3 to 6 in. long.
Spikelets rather crowded, 2 lines long. Flowering glume with a fine tooth or point on each side of the awn 4. *C. divaricata*.
- Spikelets distant, 3 lines long. Flowering glumes tapering into the awn or very minutely toothed 5. *C. acicularis*.
- Spikes digitate, slender, 3 to 6 in. long. Spikelets very obtuse or truncate.
Spikelets cuneate, truncate, 1 to 1½ line long. Flowering glume oblong, obtuse. Upper empty one broad, truncate 6. *C. truncata*.
- Spikelets very obtuse, 1½ to 2 lines. Flowering glume very broad, embracing the narrower empty one 7. *C. ventricosa*.
- Spikes digitate, dense, 1 to 2 in. long.
Flowering glume membranous, rather acute. Upper empty glume solitary, truncate 8. *C. barbata*.
- Spikes 4 to 5 in. long, fasciculate, very numerous, 3rd glume with long hairs on the margins 9. *C. *distichophylla*.
- Flowering glume broad, rigidly scarious, ciliate. Upper empty glumes several, broad, scarious, very spreading 10. *C. scariosa*.

1. ***C. unispicea*** (single spike), *F. v. M. Fragm.* vii. 118; *Benth. Fl. Austr.* vii. 611. A slender grass, from 6 in. to above 1 ft. high, glabrous except long hairs at the orifice of the sheath, branching at the base and densely tufted. Leaves short, setaceous, crowded at the base of the stem, the upper ones few and capillary. Spike single, erect, unilateral, 1½ to 4 in. long. Outer glumes very narrow, hyaline, acuminate, the lowest about 1½ line, the 2nd at least 2 lines long. Flowering glume on a hairy stipes, narrow, thin, faintly 3-nerved, tapering at the top, nearly as long as the outer glume, entire, with a fine awn of 2 to 3 lines. Terminal empty glume narrow, with a fine awn sometimes as long as, sometimes much shorter than that of the flowering glume.

Hab.: Herbert's Creek, Bowman; near Brisbane, Dr. Chas. Prentice.

2. ***C. pumilio*** (small), *R. Br. Prod.* 186; *Benth. Fl. Austr.* vii. 611. A small glabrous grass, 4 to 8 in. high, with the foliage of a *Cynodon*. Spikes 3 to 5, about 1 in. long. Spikelets narrow and crowded but all turned to one side, about 2 lines long without the awn. Outer glumes very narrow, fine-pointed, the longest scarcely 1 line long. Flowering glume lanceolate, scarcely ciliate, deeply divided into 2 narrow lanceolate lobes produced into awns either very short or nearly as long as the central one which varies from 1½ to 4 lines long. Terminal empty glumes 2 or 3, lanceolate and awned.

Hab.: Norman Creek, Gulliver.

3. ***C. pectinata*** (comb-like), *Benth. Fl. Austr.* vii. 612. Stems 1 to 1½ ft. high, with the flat leaves and loose sheaths of *C. barbata*. Spikes 7 to 14, 2 to 3 in. long, the spikelets very numerous, narrow, elegantly arranged in a single dense row. Outer glumes very narrow, almost subulate. Flowering glume very narrow, smooth or scabrous, scarcely ciliate, with 2 narrow lobes acute or produced into very short points, the intermediate almost dorsal awn very fine, 3 to 4 lines long. Terminal empty glume bifid, with a dorsal awn.

Hab.: Cashmere, Armit, with purple awns and rather small awns.

The species is intermediate as it were between *C. pumilio* and *C. divaricata*.—Benth.

4. ***C. divaricata*** (spreading), *R. Br. Prod.* 186; *Benth. Fl. Austr.* vii. 612. Star Grass. A glabrous erect tufted grass of 1 to 2 ft. Leaves narrow, flat or convolute, the sheaths often much flattened. Spikes 6 to 12, slender, 3 to 6 in. long. Spikelets very numerous, but not crowded, rarely 2 lines long without the awns. Outer glumes unequal, very narrow, finely pointed. Flowering glume

narrow, keeled, 3-nerved, the fine awn 3 to 6 lines long, with a point or narrow lobe on each side. Terminal empty glume broadly linear, 2-lobed, with an awn between the lobes sometimes as long as that of the flowering glume.

Hab.: Keppel and Shoalwater Bays and Broadsound, *R. Brown*; Rockhampton and neighbouring districts, *Bowman*, *Thozet*, *O'Shanesy* and others; Moreton Bay, *C. Stuart*; Darling Downs.

This grass is not in favour with some pastoralists, but nevertheless it provides a pasture for sheep during winter and the early months of summer, when feed is usually scarce. It makes a very fair quantity of leafy growth prior to seeding.

5. **C. acicularis** (needle-like), *Lindl. in Mitch. Trop. Austr.* 23; *Benth. Fl. Austr.* vii. 612. A glabrous erect grass of 1 to 2ft. Leaves flat, the lower sheaths broad and flattened. Spikes 6 to 12 or even more, at first erect but at length horizontally spreading as in *C. divaricata*, 3 to 4in. long, slender and often purplish. Spikelets rather distant. Outer glumes narrow, keeled, tapering to fine points, the lowest $1\frac{1}{2}$ to 2 lines, the 2nd 3 lines long. Flowering glume about 2 lines, narrow, 3-nerved, tapering into an awn of about $\frac{1}{2}$ in., with sometimes but not always a short point on each side at the base. Palea long, narrow, prominently 2-nerved. Terminal empty glume with an awn sometimes as long as that of the flowering glume but usually shorter.—*Turner Austr. Gr.* 16; *C. Moorei*, *F. v. M. in Linnæa*, xxv. 444.

Hab.: Southern inland localities.

6. **C. truncata** (truncate), *R. Br. Prod.* 186; *Benth. Fl. Austr.* vii. 612. A glabrous erect grass of 1 to 3ft. Leaves usually flat but narrow, with flattened sheaths. Spikes 6 to 10, slender, 3 to 6in. long, at length horizontally spreading. Spikelets numerous but not crowded, cuneate, 1 to $1\frac{1}{2}$ line long without the awns. Lowest outer glume very small, almost setaceous, the 2nd narrow and fine pointed, about as long as the spikelet. Flowering glume oblong, obtuse, keeled, slightly ciliate, with a fine awn of 3 to 6 lines. Terminal empty glume much shorter and broader, raised to the level of the flowering glume and flat-topped, giving the spikelet its cuneate truncate form.—*Kunth, Rev. Gram.* t. 178; *Turner Ag. Gaz. N.S.W.* ii. Pl.

Hab.: Condamine River and Bokhara Flats, *Leichhardt*; and many other southern localities. This is a tall, good pasture grass either for sheep or cattle. It also makes excellent hay.

7. **C. ventricosa** (referring to the inflated spikelet), *R. Br. Prod.* 186; *Benth. Fl. Austr.* vii. 613. Blue Star Grass. Usually rather taller than *C. truncata*, often above 2ft. high, with few flat leaves. Spikes 5 to 7 in the typical specimens, 3 to 4in. long. Spikelets cuneate and obtuse as in *C. truncata*, but larger, from $1\frac{1}{2}$ to 2 lines long, and often but not always dark-coloured. Flowering glume broad, very obtuse, embracing the much smaller terminal one, which is raised and truncate as in *C. truncata*, usually emarginate, the awns of both much shorter than the spikelet.—*Bail. Ill. Mono. Gr. Q. i.*; *C. sclerantha*, *Lindl. in Mitch. Trop. Austr.* 31.

Hab.: Bokhara Flats, *Leichhardt*; Bowen Downs, *Birch*; Armadilla, *Barton*.

A good pasture and hay grass.

Var. *tenuis*. Stems 1 to $1\frac{1}{2}$ ft. high. Leaves short and narrow. Spikes 3 to 5, about 2in. long. Spikelets smaller with longer awns, but with the broad flowering glume embracing the barren terminal one as in the typical form.—Hab.: Rockhampton, *O'Shanesy*; Nerkoel Creek, *Bowman*.

Another long-awned form has spikes of 3 to 4in.—Hab.: Bowen Downs, *Birch* (*F. v. M.*).

8. **C. barbata** (bearded), *Sw.*; *Kunth, Enum.* i. 264, var. *decora*; *Benth. Fl. Austr.* vii. 613. A glabrous grass with flat leaves and loose leaf-sheaths, closely resembling the common *C. barbata*, but the spikes dense, the awns longer and only one terminal empty glume instead of the two of the typical form. Spikes 6 to 10, $1\frac{1}{2}$ to 2in. long. Outer glumes 1 to $1\frac{1}{2}$ line long, narrow, thin

and hyaline, the 2nd keeled and tapering into a fine point. Flowering glume not broad, membranous, keeled, ciliate at the end with long hairs and slightly so on the margins, rather acute, sometimes notched, the awn very fine, 3 to 4 lines long. Terminal empty glume very obtuse or truncate, slightly emarginate, the awn nearly as long as that of the flowering glume.—*C. decora*, Nees in Steud. Syn. Glum. i. 205.

Hab.: Boulia.

9. ***C. distichophylla*** (leaves arranged in two rows), *Lagasca. Gen. et Spec. Nov. Diagn.* 4; *Trin. Spec. Gram. t.* 308. A tall leafy caespitose grass; glabrous except the inflorescence. Stems compressed, striate. Leaves distichous, the sheaths loose, compressed, forming a sharp prominent keel; ligula a short ciliate membrane. Lamina 6 to 18 in. long, 3 to 4 lines broad, of firm texture, unfolded at the base, thin, flat, the apex bluntly pointed, keel sharp and prominent. Panicle dense. Spikes 4 to 5 in. long, fasciculate, the fascicles in whorls, at first erect but soon drooping, dark-coloured. Spikelets subsessile, closely imbricate on the slender triquetrous rhachis; lower flowers hermaphrodite, upper ones neuter. Glumes membranous, 1-nerved, outer one lanceolate, acute, with usually a green midrib, 2nd with a dorsal bristle, flowering one with long ciliate margins, terminal empty one glabrous, truncate.

Hab.: Brazil. Introduced, and appears likely to become naturalised.

10. ***C. scariosa*** (dry), *F. v. M. Fragn.* vi. 85; *Benth. Fl. Austr.* vii. 614. Star Grass. Stems erect, slender but rigid, 1 to 2 ft. high. Leaves narrow with subulate points or almost entirely flat in the larger specimens, glabrous. Spikes 4 to 6, dense, 1 to 1½ in. long. Spikelets sessile, 3 to 4 lines long. Lowest glume narrow, hyaline, almost obtuse, scarcely keeled, about 2 lines long, the 2nd rather longer with a more prominent keel. Flowering glume raised on a hairy rhachis of about 1 line, rather above 1 line long, very broad and concave, prominently 3-nerved, ciliate with long hairs at the end, with a fine awn of 2 to 3 lines. Terminal empty glumes several (4 to 7), the lowest two broader than the flowering one, 5 to 7-nerved at the base, hyaline and not ciliate, very spreading and at length rigidly scarious, the upper ones gradually smaller sessile and not exceeding the outer ones.—*Bail. Ill. Mono. Gr. Q. i.*

Hab.: Rockhampton, *O'Shanesy*; Gracemere, *Bowman*; Bowen Downs, *Birch*.

A beautiful grass, but of little value for pasture; worthy of garden cultivation.

70. ASTREBLA, *F. v. M.*

(Referring to the awn not being twisted.)

Spikelets few-flowered, sessile or nearly so in the alternate notches of the continuous rhachis of one or two simple second spikes, the rhachis of the spikelet articulate above the 2 outer glumes. Outer empty glumes 2, glabrous, acute, many-nerved, unawned. Flowering glumes silky-hairy, 3-lobed, the central lobe with a broad base tapering into a straight or curved not twisted awn, the lateral lobes erect, rigid, 2 or 3-nerved. Palea with 2 prominent ciliate nerves or keels. Styles distinct, very short. The spikes are usually single, very rarely 2 together at the end of the peduncle.

The genus is limited to Australia.

1. ***A. pectinata*** (comb-like), *F. v. M. Herb.*; *Benth. Fl. Austr.* vii. 602. An erect somewhat glaucous grass of 1 to 2 ft., glabrous except sometimes a few hairs at the orifice of the sheaths. Leaves flat, ending in long points, smooth or scarcely scabrous. Spikelets sessile in the alternate notches of a second spike of two or more in., closely imbricate and turned to one side. Outer glumes 4 to 5 lines long, glabrous, acute, 9 or 11-nerved, with scarious margins. Flowering



P. ELLIOT, LITH.

Astrebla pectinata, F.v.M.
GOVT PRINTING OFFICE, BRISBANE.



F. Elliott, Lith.

Astrebla pectinata, var. *triticoides*.

GOVT PRINTING OFFICE, BRISBANE



F. ELLIOT, LITH.

Astrebla pectinata, var. *curvifolia*.

GOVT. PRINTING OFFICE, BRISBANE.

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F. Elliott, Lith.

Astrebla pectinata var. *elymoides*.

GOVT PRINTING OFFICE, BRISBANE.

glumes 3 or 4, the entire part scarcely 1 line long, densely villous outside as well as the broad base of the middle lobe; lateral lobes semilanceolate, glabrous, rigid, 4 to 5 lines long, acute, 2 or 3-nerved, with the outer margin broadly scarious; central lobe broad, ovate, concave, keeled, tapering into a slender straight awn about as long as or rather longer than the lateral lobes. Rhachis of the spikelet articulate only above the outer glumes, very hairy between the flowering ones, continued and less hairy above the perfect flowers with one or two glabrous glumes and paleæ empty or with rudimentary flowers.—*Danthonia - pectinata*, Lindl. in Mitch. Three Exped. ii. 26.

The first two varieties are those most generally known as "Mitchell Grasses." They are grasses of coarse habit, but a very little rain will cause them to sprout at the stem-joints, on which account they are prized by pastoralists. The two latter varieties are amongst our best pasture grasses.

Var. *pectinata*. Common Mitchell Grass. Spikelets woolly, closely imbricate, forming a broad spike 3 or 4 in. long, glossy when sterile or before the spikelets mature; the spikes bearing matured spikelets, very rough, and resembling a scrubbing-brush, smooth on the one side. Plants forming erect tussocks of 2 or 3 ft.—Bail. Ill. Mono. Gr. Q. i.; Turner Ag. Gaz. N.S.W. i.

Hab.: In many inland localities.

Var. *triticoïdes*. Wheat-eared Mitchell Grass. Spikelets woolly, scarcely so closely imbricate as the last, or in some distant; forming the same solitary, broad flat spike 5 or 6 in. long, and bearing the rough woolly burrs all on the one side. Plant taller and coarser than the last, attaining to the height of 4 or 5 ft.

Hab.: Barcoo.

Var. *curvifolia*. Curly Mitchell Grass. Spikelets woolly, close or distantly arranged along one side of each spike. Spikes usually 2, narrow, often nodding, 8 or 9 in. long. Plant forming erect tufts 1 or 2 ft. high, the leaves narrow and much curved.—*A. triticoïdes*, F. v. M.; Turn. Ag. Gaz. N.S.W. i.

Hab.: Georgina River.

Var. *elymoides*. Weeping Mitchell Grass. Spikelets long, narrow, nearly glabrous, singly or in parallel pairs appressed to the rhachis. Spike slender, solitary, often attaining more than 1 ft. in length. Plant decumbent, the stems several feet long.—Bail. Ill. Mono. Gr. Q. i.; Turn. Ag. Gaz. N.S.W. i.

The length of the awns or their direction is not constant enough to use for a character.

Hab.: Warrego.

The seeds of these grasses furnished the aborigines with a large proportion of their food.

71. ELEUSINE, Gærtn.

(From *Eleusis*, one of the appellations of Ceres.)

(*Dactyloctenium*, Willd. *Acrachne*, Nees.)

Spikelets several-flowered, flat, imbricate in 2 rows along one side of the digitate or scattered branches of a simple panicle, the rhachis of the spikelet articulate above the outer glumes. Glumes spreading, keeled and complicate, thin but rigid, the 2 outer empty ones usually shorter, unequal, obtuse, acute or tapering to a short point. Flowering glumes obtuse or less pointed, the terminal one usually empty or rudimentary. Palea folded. Styles short, distinct. Seed rugose, within a loose membranous pericarp, which either persists round the ripe seeds or breaks up and falls away or otherwise disappears as the ovary enlarges.

A small widely spread tropical genus. Of the three Australian species two are common weeds in warm countries, the third extends over tropical Asia and Africa.

Spikes digitate, short. Spikelets very closely packed, the glumes very pointed, the 2nd outer one almost awned. Pericarp evanescent 1. *E. ægyptiaca*.

Spikes digitate or with one lower down, 2 to 3 in. long. Glumes obtuse. Pericarp persistent 2. *E. indica*.

Spikes 6 to 12, scattered or the upper ones digitate. Glumes pointed, the flowering ones with a small tooth on each side of the point. Pericarp evanescent 1. *E. verticillata*.

1. *E. ægyptiaca* (of Egypt), Pers. Syn. i. 82; Benth. Fl. Austr. vii. 615. Button Grass. Stems tufted or creeping and rooting at the base and shortly ascending like the *Cynodon dactylon*, or rarely above 1 ft. high. Leaves flat,

ovate, flaccid, with long points. Spikes usually 3 to 5, digitate, under $\frac{1}{2}$ in. but sometimes 1 in. long, the angular rhachis prominent on the upper or inner side, the spikelets regularly and very closely packed at right angles to it on the opposite side. Outer glume about 1 line long, acute, the 2nd broader, obtuse or emarginate, the keel produced into a short dorsal awn, the rhachis of the spikelet produced above the outer glumes but glabrous. Flowering glumes broad, complicate, tapering into short spreading points. Pericarp loose over the enlarged ovary, disappearing from the ripe rugose seed.—Pluk. Almag. t. 300, f. 8; Bail. Ill. Mono. Gr. Q. i.; *Cynosurus aegyptius*, Linn. Spec. 186; *Dactyloctenium aegyptiacum*, Willd.; Kunth, Enum. i. 261; *Eleusine cruciata*, Lam.; F. v. M. Fragm. viii. 111; *E. radulans*, R. Br. Prod. 186; *Dactyloctenium radulans*, Beauv.; Kunth, Enum. i. 262.

Hab.: Islands of the Gulf of Carpentaria and Torres Strait; Booby Island, Banks and Solander; Rockingham Bay, Dullachy; Herbert's and Nerkool Creeks, Bowman; Gracemere, O'Shanesy; Ballandool River, Lockyer; Barcoo, Schneider.

A common weed of warm countries.

2. ***E. indica*** (of India), Gærtn.; Kunth, Enum. i. 272; Benth. Fl. Austr. vii. 615. Barnyard Grass, Crow-foot, Crab Grass. A coarse erect tufted grass 1 to 2 ft. high. Leaves narrow, the sheaths flattened and distichous, ciliate with a few long hairs; ligula membranous ciliate. Spikes 5 to 7, 2 to 3 in. long, digitate, with usually 1 inserted rather lower down, the rhachis prominent on the upper or inner side, the spikelets loosely imbricate on the opposite side. Each spikelet $1\frac{1}{2}$ to 2 lines long, containing 3 to 5 flowers. Glumes obtuse, the lowest small and 1-nerved, the 2nd empty one and the lower flowering ones usually 3-nerved. Pericarp persistent, very loose and membranous, enclosing the rugose seed.—Trin. Spec. Gram. t. 71; F. v. M. Fraggm. viii. 112; Turner Ag. Gaz. N.S.W. ii; *E. marginata*, Lindl. in Mitch. Three Exped. i. 819.

Hab.: Moreton Bay, Leichhardt, Bailey; Rockhampton, O'Shanesy, Thozet; Nerkool Creek, Bowman.

A common tropical and subtropical weed. A strong-growing succulent summer grass.

Var. *monostachya*. A weak plant, the largest seen under 1 ft. high; leaves narrow; spikes solitary, $1\frac{1}{2}$ to 2 in. long.

Hab.: Irvinebank, F. Bennett; Brisbane River, J. F. Bailey (this specimen was obtained in a garden and may have been obtained attached to other plants received from the north).

3. ***E. verticillata*** (whorled), Roxb.; Fl. Ind. et Car. et Wall. i. 346; Benth. Fl. Austr. vii. 616. An erect annual of 1 to $1\frac{1}{2}$ ft., with the habit of *E. indica*. Leaves flat, with loose flattened sheaths. Spikes or panicle-branches 6 to 12 or even more, varying from 1 to 3 in. long, the lower ones distant or verticillate, the upper ones almost digitate. Spikelets 2 to 3 lines long, 8 to 12-flowered. Outer empty glumes small and narrow, the lowest almost subulate, the 2nd lanceolate, keeled with a fine point. Flowering glumes rather above 1 line long, broad and 3-nerved, the keel produced into a short point, the lateral nerves ending usually in a small tooth on each side of the point. Pericarp loose over the enlarged ovary, disappearing from the rugose seed.—F. v. M. Fragm. viii. 112; *E. racemosa*, Roth, Nov. Sp. Pl. 80; *Leptochloa verticillata* and *L. racemosa*, Kunth, Enum. i. 272; *Acrachne eleusinoides* Nees in Herb. Wight, n. 118 and 1760.

Hab.: Bowen River, Bowman. Rare.

Widely spread over tropical Asia and Africa.

72. LEPTOCHLOA, Beauv.

(Slender grass.)

Spikelets several-flowered or rarely 1-flowered, sessile in 2 rows along one side of the slender usually numerous branches of a simple panicle, the rhachis of the spikelet articulate above the outer glumes and more or less produced above the

flowering ones. Glumes keeled, acute or obtuse, unawned, the 2 outer empty ones shorter or rarely as long as the flowering ones. Palea prominently 2-nerved or folded. Grain smooth or nearly so, the pericarp very thin and adnate.

The genus is generally spread over tropical and subtropical regions both in the New and the Old World.

Spikelets 5 or 6-flowered. Flowering glumes rather obtuse.

Spikes dense, mostly crowded at the ends of the rhachis 1. *L. subdigitata*.

Spikes slender, scattered along the long slender rhachis 2. *L. chinensis*.

Spikelets 1-flowered. Flowering glumes acute. Spikes slender, scattered along the long slender rhachis 3. *L. polystachya*.

1. ***L. subdigitata*** (somewhat digitate), *Trin. in Steud. Syn. Glum. i. 210; Benth. Fl. Austr. vii. 617*. Cane Grass. An erect rigid usually glaucous grass, attaining 4 or 5 ft. Leaves short, with rigid rather loose sheaths. Spikes or panicle-branches 6 to 10, crowded at the end of the peduncle with usually 1 or 2 lower down, 2 to 4 in. long. Spikelets $1\frac{1}{2}$ or rarely 2 lines long, 5 or 6-flowered, the rhachis bearing a few short hairs under each glume. Glumes about $\frac{1}{2}$ line long, obtuse or almost acute, the outer empty ones usually rather smaller, especially the lowest. Palea folded. Grain oblong, perfectly smooth, the pericarp very thin and adnate.—*Poa digitata*, R. Br. Prod. 182; *Eleusine digitata*, Spreng. Syst. Cur. Post. 36; F. v. M. Fragm. vii. 112; *F. polystachya*, F. v. M. Fragm. i. 216,

Hab.: Suttor River, F. v. Mueller; Gracemere, O'Shanesy; Darling Downs.

This is a tall tussock grass, having numerous erect branching leafy stems, and is usually met with around dams and river banks, where it affords a large supply of coarse herbage. A common inland grass of most parts of Australia.

2. ***L. chinensis*** (of China), *Nees; Steud. Syn. Glum. i. 209; Benth. Fl. Austr. vii. 617*; Stems from a creeping and rooting base ascending to 2 or 3 ft., glabrous and usually slender. Leaves narrow, flat, tapering to a point. Panicle 6 in. to above 1 ft. long, the numerous simple branches scattered or clustered along the rhachis, very slender, 2 to 4 in. long, or in the smaller weaker specimens under 2 in. Spikelets sessile or nearly so, distant or rather crowded, narrow, 1 to 2 lines long, usually 4 to 6-flowered. Outer empty glumes rather unequal, acute, flowering ones broader, obtuse.—*Poa chinensis*, Koen.; F. v. M. Fragm. viii. 132; *Leptochloa tenerrima*, Roem. and Schult.; Kunth, Enum. i. 270; *Poa decipiens*, R. Br. Prod. 181; *Eragrostis decipiens*, Steud. Syn. Glum. i. 279.

Hab.: Keppel Bay, R. Brown; Brisbane River, Moreton Bay, *Leichhardt. O. Stuart, Bailey; Bokhara Flats, Leichhardt; Rockhampton* and neighbouring districts, *Bowman O'Shanesy*.

A rather tall, feathery, grey-coloured grass, usually found on the margins of rivers, producing a large quantity of fodder, relished by stock. The panicle is very delicate and drooping. Found throughout Queensland and many other warm countries.

3. ***L. polystachya*** (many spikes) *Benth. Fl. Austr. vii. 617*. An erect grass of 3 ft. or more, the lower nodes sometimes bearded, otherwise glabrous and glaucous. Leaves convolute with subulate points and rather loose sheaths, the lower ones flat. Spikes very numerous and slender, 1 to 2 in. long, crowded in a long narrow simple panicle of 8 to 10 in., the common rhachis slightly flattened and striate. Spikelets 1-flowered, nearly sessile. Outer glumes $\frac{3}{4}$ to nearly 1 line long, acute, with a prominent glabrous or slightly ciliate keel. Flowering glume rather shorter, glabrous or minutely pubescent. Palea prominently 2-nerved, rhachis produced behind it into a minute point, sometimes quite obsolete, sometimes according to F. Mueller bearing an empty glume. Grain oblong, smooth, the pericarp not distinguishable when ripe.—*Cynodon polystachyus*, R. Br. Prod. 187; F. v. M. Fragm. viii. 113; *C. virgatus*, Nees in Steud. Syn. Glum. i. 213; *C. Neesii*, Thw. Enum. Pl. Ceyl. 371.

Hab.: Islands of the Gulf of Carpentaria, R. Brown; Etheridge and Gilbert Rivers, *Sullivan; Burdekin River, Bowman*.

Also in Ceylon and in the E. Indian Peninsula.

78. PAPPOPHORUM, Schreb.

(Flowering glume resembling the pappus of *Compositæ*.)

Spikelets with one hermaphrodite flower and one or more male or rudimentary flowers or empty glumes above it, in a short dense and spikelike or narrow and loose panicle, the rhachis of the spikelet articulate above the outer glumes and hairy round the flowering glume. Outer glumes membranous, many-nerved, awnless, as long as the spikelet. Flowering glume broad, membranous, with 9 or in some species more-nerved, produced into more or less plumose awns. Palea 2-nerved, as long as the glume or longer. Styles distinct. Grain enclosed in the glume and palea, free from them.

Besides the Australian species, which are perhaps endemic, one extending to New Guinea, others are met with in Asia, Africa and America.

Outer glumes 1 to 2 lines long, 5 to 9-nerved 1. *P. nigricans*.
Outer glumes 3 lines long, 11 to 21-nerved 2. *P. avenaceum*.

1. ***P. nigricans*** (blackish), *R. Br. Prod.* 185; *Benth. Fl. Austr.* vii. 600. Stems 1 to 2ft. high. Leaves flat or convolute, usually narrow, sometimes quite setaceous, glabrous pubescent or villous, the nodes glabrous or bearded. Panicle dense and spikelike, varying from ovoid-oblong and under $\frac{1}{2}$ in. long, to narrow cylindrical and 3 in. long, or broader more branched and 2 to 3 in. long, but always dense, pale or dark-coloured. Outer glumes varying from 1 to rather above 2 lines long, obtuse or acute, striate with usually 7 or 9 nerves, but sometimes especially on the lowest glume reduced to 5 and 2 of those short. Flowering glume not above 1 line long, more or less hairy outside especially at the base, with 9 fine spreading plumose awns varying from the length of the glume to twice as long. Above the flowering glume and enclosed in it is usually a similar smaller one with a male or rudimentary flower, and 1 or 2 still smaller empty ones.—*Turn. Ag. Gaz. N.S.W.* ii.; *P. pallidum*, *R. Br. l.c.* Kunth, *Rev. Gram.* t. 51; *P. purpurascens* and *P. gracile*, *R. Br. l.c.*, *P. carulescens*, *Gaudich. in Freyc. Voy. Bot.* 409; *P. flavescescens*, *Lindl. in Mitch. Trop. Austr.* 84; *P. virens*, *Lindl. l.c.* 860; *P. commune*, *F. v. M. Fragn.* viii. 200.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown, Henne*; Broadsound and Keppel Bay. *R. Brown*; Port Curtis, *M'Gillivray*; King's Creek, *Bowman*; Peak Downs *Burkitt*.

The forms or species could only be safely separated by having all the kinds cultivated under the same conditions when the distinctive characteristics might be noticed and described.

2. ***P. avenaceum*** (Oat-like), *Lindl. in Mitch. Trop. Austr.* 320; *Benth. Fl. Austr.* vii. 601. Very near the *P. nigricans*, with the same habit but the spikelike panicle looser with fewer and larger spikelets. Outer glumes fully 3 lines long, with numerous nerves, usually more than 11 and sometimes as many as 21. Flowering glumes several, closely imbricate, the outer ones with a fertile flower enclosing 1 or 2 with male (or sometimes a second fertile) flowers and 1 or 2 small empty glumes.

Hab.: Southern and inland localities, not so common as the last-mentioned species.

74. PHRAGMITES, Trin.

(From the Greek for "enclosure," the reeds being used for fencing.)

Spikelets 3 or more flowered, flat when open, all pedicellate in a large much-branched panicle, the rhachis of the spikelet elongated between the flowering glumes and covered with very long silky hairs enveloping the flowers. Glumes thin, keeled, the 2 outer ones empty, acute or shortly pointed, the 3rd like them but with a longer point and enclosing a male or rudimentary flower, the others more distant with long almost awn-like points, the rhachis terminating in a rudimentary glume or bristle-like point. Palea 2-ribbed. Stigmas nearly sessile.

A small genus extending over the tropical and temperate and some colder regions of the New as well as the Old World, the Australian species being the common one over nearly the whole area, in wet ditches, marshes, and shallow waters.

1. **P. communis** (common), *Trin.*; *Kunth, Enum. i. 251*; *Benth. Fl. Austr. vii. 696*. Common Reed. A stout perennial usually 5 to 7 ft. high, but sometimes twice as much, with a long creeping rootstock and numerous long leaves often an inch broad, the sheaths covering the stems to the inflorescence. Panicle 6 in. to 1½ ft. long, with numerous branches, more or less one-sided and drooping, often of a purplish brown tinge. Spikelets numerous, at first very narrow, 4 to 6 lines long, flat and spreading when in seed, the long silky hairs proceeding from the rhachis and as long as or longer than the glumes, giving the panicle a beautiful silvery aspect; the glumes themselves and the short part of the rhachis below the 3rd glume quite glabrous.—*Hook. f. Fl. Tasm. ii. 118*; *Reichb. Ic. Fl. Germ. t. 108*; *Arundo phragmites*, *Linn.*; *R. Br. Prod. 188*.

Hab.: Brisbane River and many other localities in the south; in the north Goold Island, *M'Gillivray*; Cape Grafton, *A. Cunningham*; Rockingham Bay, *Dallachy*; Cairns, *Bailey*.

This is the common Reed so abundant on the margins of rivers and in swamps; it is useful as affording food for stock during dry seasons. In the tropics, especially at the Barron River, although the plant is equal in size to the southern one, it is much more tender, and has a greater tendency to sprout at the joints, and therefore a better fodder.

The natives make their reed-spears from the stems of this grass; using the stems of *Sesbania ægyptiaca* or pea-bush, called by them "Ngeen-jerry," for the sharp woody-point.—*E. Palmer*.

75. ELYTROPHORUS, Beauv.

(Referring to the large outer glume.)

Spikelets small and flat, few-flowered, sessile, in dense compound globular clusters crowded in a cylindrical spike or the lower ones distant, the rhachis of the spikelet glabrous, articulate under the flowering glumes. Outer empty glumes narrow, membranous, keeled with short points. Flowering glumes 8-nerved, tapering into long points or short awns, 1 or 2 upper glumes empty or with male flowers. Palea folded, with two dorsal wings. Stamen 1. Styles free, distinct. Grain smooth, free.

The genus is limited to the single Australian species, widely spread over tropical Asia and Africa.

1. **E. articulatus** (jointed), *Beauv.*; *Kunth, Enum. i. 391, Rev. Gram. t. 154*; *Benth. Fl. Austr. vii. 698*. An erect glabrous annual, from under 6 in. to rather above 1 ft. high including the inflorescence. Leaves flat, often longer than the stem, with loose sheaths. Spikelets small and very numerous, the globular clusters sessile in a cylindrical spike 3 to 4 lines diameter and often occupying the greater part of the plant, either continuous throughout or interrupted and shortly branched at the base. Glumes rarely 1 line long without the points, the awns of the flowering ones about as long as or rarely longer than the glume. Dorsal wings of the palea entire or denticulate, either both or one only rather broad.

Hab.: Between Norman and Gilbert Rivers, *Gulliver*; Rockhampton and neighbouring districts, *O'Shanesy, Bowman*; Bowen Downs, *Birch*.

76. KÆLERIA, Pers.

(After M. Kœhler.)

Spikelets 2 or more-flowered, flat, shortly pedicellate, numerous in a dense spike-like cylindrical or interrupted panicle, the rhachis of the spikelet articulate between the flowering glumes, glabrous. Glumes keeled, acute or produced into short straight awns or points, 2 outer empty ones unequal and scarious on the margin only; flowering glumes similar but more scarious or hyaline, the upper ones gradually smaller, the lowest the largest and sessile within the empty ones,

the uppermost one or two usually empty. Palea very thin, acutely 2-keeled, 2-toothed or 2-pointed. Styles very short. Grain enclosed in the glume and palea free from them.

A small genus ranging over the temperate regions of the northern hemisphere, more sparingly distributed in the southern, and perhaps, most frequently introduced. The Queensland species is a common northern one.

1. **K. phleoides** (Phleum-like), *Pers.*: Kunth, *Enum.* i. 888; *Benth. Fl. Austr.* vii. 639. An erect tufted annual of 6 in. to 1 ft. usually glabrous except long cilia on the margins and orifice of the leaf-sheaths. Spike-like panicle $\frac{3}{4}$ to 2½ in. long, cylindrical or when large slightly branched. Spikelets about 2 lines long, with 5 to 7 flowers. Glumes very spreading, the larger ones 1½ lines long with a point or awn rarely above 1 line long, the outer empty ones unequal, the lowest small and acute, the 2nd shortly pointed and nearly as long as the flowering ones, the terminal empty glume or glumes usually broader, shorter and awnless.

Hab.: Near Stanthorpe.

The species extends over the whole of the Mediterranean region from the Azores to Afghanistan, and may be introduced only into Queensland.

77. ERAGROSTIS, Beauv.

(From *eros*, love, and *agrostis*, grass; referring to the beautiful panicles.)

Spikelets several, usually many-flowered, pedicellate or sessile in a loose and spreading or narrow and clustered panicle, the rhachis of the spikelet usually glabrous and articulate under the flowering glumes, but often very tardily so and sometimes inarticulate. Outer empty glumes unequal and rather shorter than the flowering ones, keeled, without any or only faint lateral nerves. Flowering glumes obtuse or acute, unawned, 3-nerved, the keel prominent, the lateral nerves in a few species very faint. Palea shorter than the glume, with 2 prominent nerves or keels, often persisting after the glume and grain have fallen away. Grain free, ovoid or oblong, not furrowed.

The genus is as widely spread as *Poa* in warm and temperate regions, but disappears in cold countries and high mountains. Most, if not all, the species of this genus are good pasture grasses.

SECT. I.—**Chaunostachya**.—Spikelets somewhat flattened, the glumes rather distant, loosely imbricate, overlapping the rhachis at the base so as not to leave a longitudinal furrow, usually very thin with the lateral nerve on each side faint or marginal.

The first three species have the few-flowered spikelets with the rhachis very readily disarticulating of *Poa*, but always only one instead of two nerves on each side of the keel of the flowering glumes.

Spikelets usually 3 or 4-flowered, pedicellate, in a spreading panicle.

Spikelets very numerous and minute, $\frac{1}{4}$ to $\frac{3}{4}$ line long. Grain ovoid, smooth.

1. *E. interrupta*.

Spikelets on long capillary pedicels, 1 to 2 lines long. Grain globular, tuberculate.

2. *E. nigra*.

Spikelets few, shortly pedicellate, in a loose panicle, 1 to 2 lines long. Grain ovoid, smooth.

3. *E. imbecilla*.

Spikelets linear, more than 6-flowered.

Glumes acute or rarely almost obtuse.

Spikelets numerous, pale-coloured, shining, shortly pedicellate and crowded on the long branches of a narrow panicle.

Grain oblong-linear.

4. *E. leptocarpa*.

Grain broadly obovoid.

5. *E. megalosperma*.

Spikelets numerous, very narrow linear, shortly pedicellate and distant along the capillary erect branches of the panicle.

6. *E. pilosa*.

Spikelets not very numerous, linear-lanceolate, pedicellate, in a spreading panicle.

7. *E. leptostachya*.

SECT. II. **Megastachya**.—Spikelets when mature very flat. Glumes closely imbricate in 2 distinct rows, leaving a longitudinal furrow or depression between them on each side of the spikelet, the lateral nerve usually prominent in the middle of each side of the glume.

Base of the stems glabrous, not at all or scarcely thickened.

Spikelets under 3 lines, sessile in small dense globular or oblong clusters sessile along a simple rhachis. Stamens usually 2 8. *E. diandra*.

Spikelets 3 to 6 lines, rather narrow, usually sessile and erect, scattered or clustered, rarely shortly pedicellate and spreading, in a simple or branched panicle. Stamens usually 3 9. *E. Brownii*.

Spikelets 3 to 6 lines long, broad sessile and crowded on a short almost simple rhachis. Palea-keels ciliate with long rigid hairs 10. *E. concinna*.

Spikelets narrow, clustered along the long erect branches of a narrow panicle. Palea narrow, truncate, glabrous, not above $\frac{1}{2}$ as long as the glume 11. *E. speciosa*.

Base of the stem and short sheath of radical leaves thickened into an almost bulbous woolly-hairy base.

Spikelets shortly pedicellate, nearly 2 lines broad, the base of the flowering glumes woolly-hairy 12. *E. laniflora*.

Spikelets sessile, scattered, glabrous, above 1 line broad 13. *E. eriopoda*.

Spikelets shortly pedicellate, glabrous, about $\frac{3}{4}$ line broad 14. *E. chætophylla*.

Spikelets pedicellate, scattered, dark-purplish; glumes about $\frac{1}{2}$ line long, almost hyaline. Edge of palea ciliate 15. *E. Rankingi*.

Spikelets erect, appressed to the rhachis, 4 to 6-flowered. Glumes keeled, nerves rough with ciliate margins 16. *E. stricta*.

SECT. III. **Cylindrostachya**.—Spikes very narrow, terete or nearly so. Glumes closely appressed.

Spikelets 10 to 30-flowered, rather obtuse, shortly pedicellate in a small panicle 17. *E. lacunaria*.

Spikelets 12 to 50-flowered, obtuse, sessile, usually clustered, often incurved 18. *E. falcata*.

Spikelets 8 to 10-flowered, rather acute, nearly sessile, divaricate, on the spreading branches of the panicle 19. *E. stenostachya*.

Spikelets 2-ranked, 5 to 6 lines long, 16 to 20-flowered, $\frac{3}{4}$ line long 20. *E. bifaria*.
var. *australiana*.

1. ***E. interrupta*** (interrupted), Beauv. *Agrost.* 71; Hook. in *Fl. Brit. Ind.* vii. 316, var. *tenuissima*, Stapf. An erect tufted annual, from 6 in. to near 2 ft. high. Leaves flat, usually narrow, glabrous. Panicle usually occupying the greater part of the plant, with very numerous capillary much divided branches, the lower ones in distant whorls or clusters. Spikelets pedicellate, minute, rarely $\frac{3}{4}$ line long, with 3 or 4 or rarely 6 flowers. Glumes thin, almost hyaline, obtuse, about $\frac{1}{2}$ line long, the lateral nerve on each side almost marginal, very loosely imbricate, the rhachis articulate. Palea glabrous, as long as the glume. Stamens varying 1 to 3. Grain very small, ovoid.—Bail. III. Mono. Gr. Q. i.; *Poa tenella*, Linn.; R. Br. *Prod.* 181; *Eragrostis tenella*, Beauv.; Benth. *Fl. Hongk.* 431; Benth. *Fl. Austr.* vii. 643; Duthie's *Ind. Grass*, t. 78.

Hab.: Gulf of Carpentaria, Landsborough, Gulliver; Broadsound, R. Brown; Port Denison, Fitzalan; Rockhampton and neighbouring districts, Thozet, Bowman, O'Shanesy; Kennedy district, Daintree; Mitchell district, Birch. An excellent pasture and hay grass. Widely spread in eastern tropical Asia.

2. ***E. nigra*** (black), Nees in Steud. *Syn. Glum.* 267, var. *trachycarpa*; Benth. *Fl. Austr.* vii. 643. Leaves only seen in one specimen, narrow, rather short, glabrous. Panicle 1 ft. long or more, very loose, with very long capillary divided branches, bearing few small dark-coloured spikelets on long capillary pedicels, the spikelets ovate, 1 to 2 lines long, loosely 2 to 4-flowered, quite glabrous. Flowering glumes broad, obtuse or scarcely acute, hyaline, the lateral nerves scarcely conspicuous. Palea as long, usually broad. Stamens 3, with small anthers. Grain large in proportion, globular, prominently rugose-tuberculate.

Hab.: Stanthorpe.

It is on the authority of Munro that I have referred this to the East Indian *E. nigra*, from which our specimens differ slightly in the longer pedicels and more prominently rugose grain.—Benth.

8. ***E. imbecilla*** (feeble), *Benth. Fl. Austr.* vii. 643. Stems tufted and branched at the base, weak and filiform, ascending to from 6in. to 1ft. Leaves very narrow, spreading. Panicle loose and slender, with few distant branches mostly undivided. Spikelets few, pedicellate, $1\frac{1}{2}$ to 2 lines long, rather loosely 4 to 6-flowered, glabrous. Flowering glume scarcely above $\frac{1}{2}$ line long, hyaline, the lateral nerves almost or quite marginal. Palea curved, sometimes persistent, but usually falling off with the glume on the rhachis disarticulating.—*Poa imbecilla*, Forst. (name only); Spreng. Mant. i. Fl. Hal. 38; Hook. f. Handb. N. Zel. Fl. 337, but not of R. Br.; *P. Sprengelii*, Kunth. Enum. i. 368, wrongly referred by Steudel to *P. implexa*, Trin.

Hab.: Herbert's Creek, Bowman.

4. ***E. leptocarpa*** (grain slender), *Benth. Fl. Austr.* vii. 644. An elegant slender grass, from under 1ft. to 2ft. high, with much of the habit, the flat leaves and inflorescence of *E. interrupta*. Panicle at first narrow, at length spreading with numerous much divided capillary branches, the lower ones often clustered and in the larger specimens 6in. long and the whole panicle 9 or 10in., in other specimens much smaller. Spikelets narrow-linear, 2 to 3 lines long, loosely 6 to 12-flowered, pale-coloured and shining, glabrous. Glumes very narrow, rather acute, $\frac{3}{4}$ line long, thin and hyaline, the lateral nerves not very conspicuous. Palea nearly as long. Stamens usually 2, anthers very small. Grain oblong-linear, sometimes very narrow and as long as the glume, in other specimens shorter.

Hab.: Mitchell district, Birch.

5. ***E. megalosperma*** (grain large), *F. v. M. Herb.*; *Benth. Fl. Austr.* vii. 644. Stems 2 to 3ft. high, the branches almost filiform but often rigid and clustered. Leaves long and narrow, flat or convolute, glabrous. Panicle narrow and compact, 3 to 8in. long, with erect branches. Spikelets sessile or shortly pedicellate, erect, crowded, linear, about 3 lines long when fully out, rather silvery-shining, loosely 6 to 8-flowered, the rhachis glabrous, scarcely articulate. Flowering glumes about 1 line long, acute, the lateral nerves often scarcely conspicuous at the base. Palea nearly as long, scarcely curved. Stamens usually 2, oblong. Grain broadly ovoid, often $\frac{3}{4}$ as long as the glume, readily falling away leaving the glume and palea more persistent.

Hab.: Rockhampton, O'Shanesy; Gwydir River, Leichhardt.

6. ***E. pilosa*** (pilose), *Beauv. Agrost.* 71; *Benth. Fl. Austr.* vii. 645. A tufted erect or ascending annual, 1 to near 2ft. high. Leaves narrow, usually flat. Panicle 6in. to 1ft. long, narrow at first, spreading when in fruit, with numerous long capillary divided branches. Spikelets 2 to 4 lines long, narrow linear, usually of a dark leaden colour but pale when old, loosely 6 to 20-flowered, the rhachis scarcely articulate. Glumes thin, distinctly keeled, the lateral nerves faint and short. Palea nearly as long, slightly ciliate on the keels, often persistent after the glumes have fallen away. Grain ovoid-oblong, smooth.—Turner Austr. Gr. 26; *Poa pilosa*, Linn.; Kunth, Enum. i. 329; *P. verticillata*, Cav. Ic. i. 63, t. 93; *P. parviflora* and *P. pellucida*, R. Br. Prod. 180, 181; *E. parviflora*, Trin. in Mem. Acad. Petersb. 1831, 411; *E. pellucida*, Steud. Syn. Glum. 279; *P. tenella*, Sieb. Agrostoth. n. 79, not of Linn.

Hab.: Broadsound, R. Brown; Kennedy district, Daintree; Rockhampton and neighbouring districts, Bowman, Thozet, O'Shanesy; Brisbane River.

A common weed in the warmer and some temperate regions of the northern hemisphere, chiefly in the Old World. The hairs at the base of the branches of the panicle, which originally gave rise to the specific name, are not observable in any of the Australian specimens and not constant in European ones.—*Benth.*

Affords a large amount of sweet food for the greater part of the year.

7. **E. leptostachya** (spikes slender), *Steud. Syn. Glum. i. 279*; *Benth. Fl. Austr. vii. 645*. Stems slender, usually about 1ft. high. Leaves at the base narrow, convolute or setaceous, glabrous. Panicle loosely pyramidal, 8 to 6in. long, with slender divided spreading branches. Spikelets on capillary pedicels of 1 to 3 lines, loosely spreading, about 2 lines long, narrow, but much broader than in *E. pilosa*, much smaller than in *E. Brownii*, loosely 6 to 10-flowered, usually dark-coloured. Glumes acute, more spreading than in *E. pilosa*, the lateral nerves faint and almost marginal. Palea nearly as long, glabrous. Grain ovoid, smooth.—Turner Ag. Gaz. N.S.W. ii; *Poa leptostachya*, R. Br. Prod. 180.

Hab.: Brisbane River, Bailey; King's Creek, Bowman.

This species appears to be intermediate between *E. pilosa* and *E. Brownii*, var. *patens*, but distinct from both.—*Benth.*

8. **E. diandra** (2 stamens), *Steud. Syn. Glum. i. 279*; *Benth. Fl. Austr. vii. 646*. Stems 1 to 2ft. high. Leaves very narrow, often convolute, glabrous. Panicle usually contracted into an interrupted spike of 8 to 6in. Spikelets very numerous, rarely above 2 lines long, flat, scarcely 1 line broad, 6 to 12-flowered, sessile in dense sessile clusters, the upper ones forming a cylindrical spike 3 or 4 lines diameter, the lower clusters usually distant, the lowest oblong or forming a cylindrical sessile spike of $\frac{1}{2}$ in. or more. Flowering glumes closely distichous, thin, rather obtuse, the lateral nerves in the centre of each side or near the margin. Rhachis tardily or not at all articulate. Palea nearly as long as the glume, incurved. Stamens 2 with small anthers but perhaps sometimes 8. Grain ovoid.—*Poa diandra*, R. Br. Prod. 180; *P. interrupta*, Sieb. Agrostoth. n. 74.

Hab.: Keppel and Shoalwaters Bays, R. Brown; Northern districts, Gulliver, Armit; Rockhampton and southern districts, Thozet, Bowman, Leichhardt, Bailey and others.

In the case of some specimens it is difficult to decide whether they should be referred to this species or to an extreme form of *E. Brownii*, though generally the two appear very distinct. The number of stamens, 2 in *E. diandra*, 3 in *E. Brownii*, is not constant.—*Benth.*

An excellent grass for pasture and hay.

9. **E. Brownii** (after Dr. R. Brown), *Nees in Steud. Syn. Glum. i. 279*; *Benth. Fl. Austr. vii. 646*. A very variable plant in stature and aspect, usually above 1ft. high, with very narrow flat or convolute leaves, glabrous except a few cilia at the orifice of the sheaths not by any means constant. Panicle sometimes simple and dense, a few inches long, almost spikelike with numerous small densely clustered spikelets, always however longer and more acute than in *E. diandra*, sometimes with short spreading branches and few spikelets, sometimes a foot long with few distant branches and long spikelets singly scattered or in distinct clusters, and a great variety of intermediate forms. Spikelets always sessile or very nearly so, flat, varying from $\frac{1}{2}$ to $\frac{1}{4}$ in long, with 10 to 40 flowers, the rhachis very tardily articulate. Flowering glumes closely distichous, the lateral nerve nearly central on each side and prominent. Palea shorter than the glume, incurved the keels usually minutely ciliate. Stamens usually 3, but sometimes only 2 even in the larger spikelets. Grain ovoid, oblong, smooth.—Bail. Ill. Mono. Gr. Ql. i.; *Poa polymorpha*, R. Br. Prod. 180; *Megastachya polymorpha*, Beauv. Agrost. 74; *Poa Brownii*, Kunth, Enum. i. 333.

Hab.: Islands of the Gulf of Carpentaria, R. Brown, Henne; Prince of Wales Island and Keppel Bay, R. Brown; numerous localities in northern and southern and in the interior, A. Cunningham, F. v. Mueller, McGillivray, Bowman, O'Shanesy and many others.

This is very variable but excellent pasture grass; grows more or less all the year through. The herbage is sweet and nutritious; it also is a good kind for hay.

Var. *interrupta*. A larger plant, often 3 or 4ft. high, with long flat leaves and large spikelets in dense distinct clusters.—*Poa interrupta*, R. Br. Prod. 180; *Eragrostis interrupta*, Steud. Syn. Glum. i. 279.

Hab.: Endeavour River, *Banks and Solander*; Islands of Moreton Bay.

Var. *patens*. Panicle loose, often spreading. Spikelets rather small, most of them shortly pedicellate. A common southern variety. A good pasture grass.
The species appears to be widely spread in East India.

10. ***E. concinna*** (neat), *Steud. Syn. Glum.* i. 279; *Benth. Fl. Austr.* vii. 647. A rigid tufted grass under 1ft. and often under 6in. high. Leaves convolute, subulate, erect, glabrous except a few cilia at the orifice and margins of the sheaths. Panicle reduced to an interrupted spike shorter than the leaves. Spikelets sessile or nearly so, in dense clusters but not numerous, erect, very flat, pale coloured, 3 to 5 lines long and $1\frac{1}{2}$ lines broad, with 10 to 20 or even more flowers, the rhachis at length articulate. Flowering glumes closely distichous, rather rigid, $1\frac{1}{2}$ lines long, the lateral nerve on the middle of each side very prominent. Palea rather broad, the keels ciliated especially in the upper half with long rigid cilia. Stamens 2, with very small anthers.—*Poa concinna*, R. Br. Prod. 180.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*.

11. ***E. speciosa*** (showy), *Steud. Syn. Glum.* i. 279; *Benth. Fl. Austr.* vii. 689. Stems 2 to 3ft. high. Leaves long and narrow, convolute, almost filiform, glabrous. Panicle long and narrow or with a few long erect branches, the lower ones distant. Spikelets sessile, more or less clustered, glabrous, of a pale or leaden colour, very flat and neat, 3 to 6 lines long, about $\frac{3}{4}$ line broad, with 10 to 20 flowers in some specimens, as many as 40 in others, the rhachis scarcely articulate. Glumes very thin, obtuse, $\frac{3}{4}$ line long, the lateral nerve prominent at the base on each side. Palea not $\frac{1}{2}$ as long, curved, truncate, persistent. Stamens 2 in the flowers examined.—*Poa elegans*, R. Br. Prod. 181; *P. speciosa*, Roem. and Schult. Syst. ii. 573.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*; Robinson River, *Armit*; Gracemere, *O'Shanesy*; King's Creek, *Bowman*.

12. ***E. laniflora*** (woolly flowers), *Benth. Fl. Austr.* vii. 648. Rhizome and somewhat bulbous bases of the stems woolly-hairy. Stems 1 to $1\frac{1}{2}$ ft. high, slightly cottony at the nodes. Leaves narrow, flat, with scabrous sheaths. Panicle loose, 4 to 6in. long, with few divaricate or reflexed scabrous branches. Spikelets very shortly pedicellate and not numerous, divaricate or reflexed, very flat, 4 to 8in. long, nearly 2 lines broad, with 20 to 50 flowers, the rhachis tardily articulate. Glumes rather broad, very thin, closely distichous, enveloped at the base in woolly hairs. Palea nearly as long, the keels ciliate with soft hairs near the base. Stamens 3, with rather long anthers. Grain globular.

Hab.: An inland species.

13. ***E. eriopoda*** (woolly base), *Benth. Fl. Austr.* vii. 648. Stems 1 to $1\frac{1}{2}$ ft. high, somewhat bulbous and densely woolly at the base. Leaves very narrow, short, the lower sheaths pubescent or hirsute. Panicle in some specimens reduced to an interrupted spike, in others divided into spreading branches. Spikelets nearly sessile, scattered or in pairs, very flat, 3 to 9 lines long, above 1 line broad, with 10 to 80 or more flowers. Glumes closely distichous but rather spreading, obtuse, almost hyaline with a dark green nerve. Stamens 2, with rather large anthers.

Hab.: An inland species.

14. ***E. chætophylla*** (bristle-like leaves), *Steud. Syn. Glum.* i. 279; *Benth. Fl. Austr.* vii. 648. Stems from a shortly thickened almost bulbous slightly woolly-hairy base densely tufted, slender but rigid, 6in. to 1ft. high, often leafy to the inflorescence. Leaves very narrow, convolute or setaceous, glabrous. Panicle narrow, $1\frac{1}{2}$ to 3in. long, shortly branched. Spikelets usually rather

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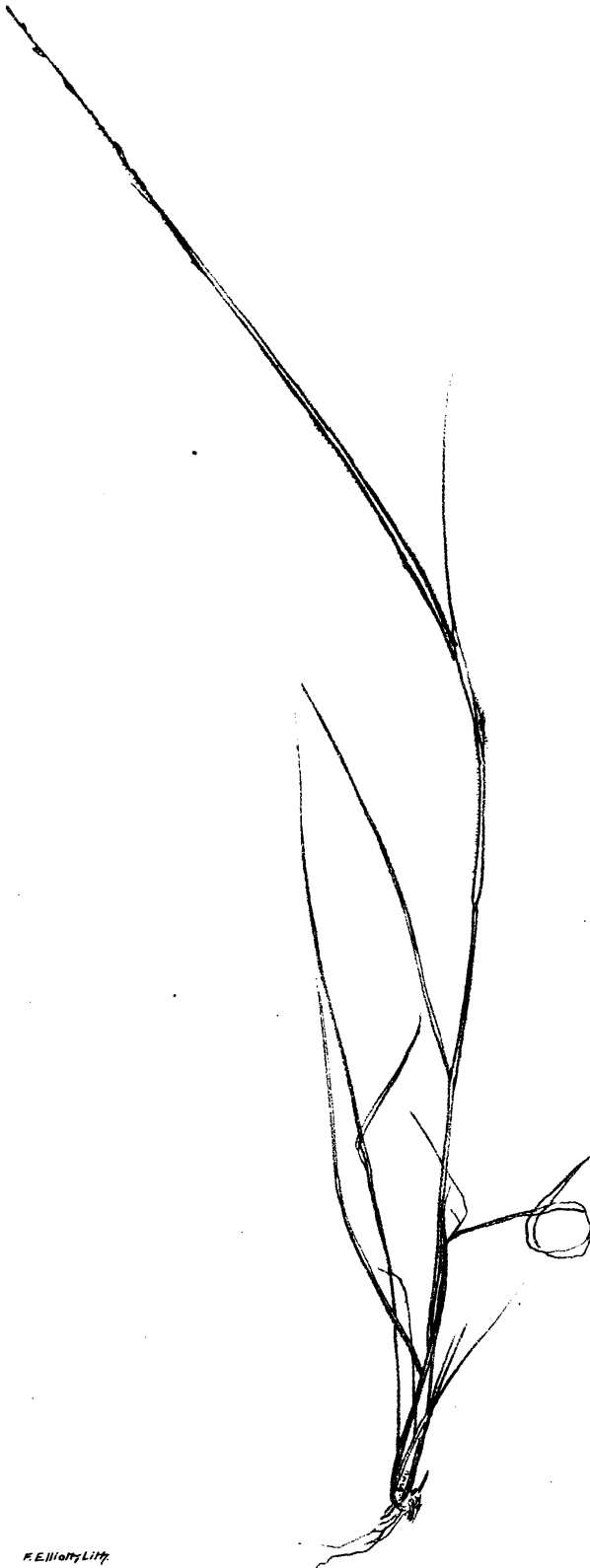
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Fellion, Lith.

Eragrostis Rankingi, Bail.
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F. ELLIOTT, LITH.

numerous, shortly pedicellate, scattered or crowded, flat and thin, 2 to 4 or rarely 6 lines long, 1 to $1\frac{1}{2}$ lines broad, 6 to 30-flowered. Glumes closely distichous or rather loose, $\frac{1}{2}$ line long, obtuse or almost acute, hyaline or purplish, the lateral nerve prominent on each side at the base. Palea nearly as long, glabrous. Stamens 3. Grain small, ovoid-oblong.—Bail. Ill. Mono. Gr. Q. i.; *E. setifolia*, Nees in Hook. Lond. Journ. ii. 419, not of Benth.; *Poa diandra*, F. v. Muell. Rep. Rabb. Exped. 21, not of R. Br.

Hab.: Mitchell district, *Birch*; and many other inland localities.

15. **E. Rankingi** (after R. A. Ranking), *Bail. Bot. Bull.* 2. Stems tufted, slender, leafy, erect, 6 to 12 in. high, slightly knotted, and with little woolly hairs at the base. Leaves spreading, narrow-lanceolate when growing, much convolute and appearing setaceous in drying, the lower ones and sometimes all clothed with longish hairs 1 to 2 in. long. Panicles 3 to 6 in. long, the branches divaricate, rather short. Spikelets pedicellate, scattered, dark-purplish, about 3 or 4 lines long and not $\frac{1}{2}$ line broad, with 8 to 16 flowers. Glumes closely distichous, about $\frac{1}{2}$ line long, obtuse or almost acute, very thin almost hyaline, purple with a slight mark down the centre, the edges light-coloured and ciliate. Palea very obtuse, long as the glume, edge ciliate. Stamens 3; anthers purple; grain ovoid, smooth, minute.

Hab.: Blackall, R. A. Ranking; Miles, Bailey.

It approaches *E. eriopoda* in its hairy leaves, but has not the bulbous base of that species. It also resembles *E. chatophylla*, but its leaves are never entirely glabrous, and the spikelets are not more than half the width of either of those species.

16. **E. stricta** (upright), *Bail. Bot. Bull.* 3. A slender, erect, hairy, tufted grass, of from 12 to 18 in. high. Leaves narrow-linear, the upper ones 5 to over 6 in. long, convolute so as to appear filiform when dry, the lower ones flat about 2 lines broad, the woolly hairs about the mouth of the sheath almost concealing the short scarious ligula. Panicle spikelike, 4 or 5 in. long, formed of 8 or 9 alternate spikelets, erect and usually closely appressed to the rhachis, lower ones pedunculate, upper ones nearly or quite sessile, under 3 lines long, and about $\frac{1}{2}$ line broad, 4 to 6-flowered. Glumes closely distichous, outer keeled and acute, with the keel and lateral nerves rough, flowering glumes obtuse, with ciliate margins, palea also with ciliate margins. Stamens 3.

Hab.: Walsh River, T. Barclay-Millar.

On this grass has been found the fungus *Hypocrea* (*Hypocrella*) *axillaris*, Cooke.

17. **E. lacunaria** (pitted), F. v. M. *Herb.*; Benth. *Fl. Austr.* vii. 649. Stems slender, almost filiform but rigid, 6 in. to 1 ft. or rarely $1\frac{1}{2}$ ft. high, the base sometimes almost bulbous but glabrous. Leaves very narrow, almost setaceous, usually short. Panicle loose, 2 to 4 in. long, with short spreading rather rigid branches. Spikelets few on the branches, shortly pedicellate, very narrow, 3 to 6 lines long, 10 to 24-flowered, terete or very slightly flattened. Flowering glumes closely appressed, broad, obtuse, scarcely $\frac{1}{2}$ line long, usually purple, keeled, but the lateral nerves very faint or obsolete, the rhachis scarcely articulate. Palea nearly as long.

Hab.: Gracemere, O'Shanesey; near the Barcoo, *Birch*; Darling Downs, Law; also in Mitchell's subtropical collection.

With the habit and inflorescence nearly of *E. chatophylla*, this has the spikelets rather of *E. falcata*.

18. **E. falcata** (sickle-shaped), Gaudich. in Freyc. *Voy. Bot.* 408, t. 25; Benth. *Fl. Austr.* vii. 649. A slender tufted glabrous grass, varying from a few inches to about 1 ft. high. Leaves narrow, convolute, erect. Panicle narrow, usually secund, slightly compound, 2 to 4 in. long. Spikelets sessile or nearly so, crowded or clustered along the short branches, very narrow, nearly terete, often

curved, from 4 or 5 lines to 1 in. long and $\frac{1}{2}$ line broad, with 12 to 50 or even more flowers, the rhachis scarcely articulate. Flowering glumes closely appressed, scarcely 1 line long, obtuse, hyaline at the end, the keel and a lateral nerve on each side very prominent. Palea rather shorter, curved, persistent. Styles slender. Grain ovate, flattened.—Maid. Gr. N.S.W. 178; *Poa falcata*, Gaudich. l.c.

Hab.: Mitchell district, *Birch*.

19. ***E. stenostachya*** (slender spikelets), *Steud. Syn. Glum.* i. 279; *Benth. Fl. Austr.* vii. 650. Stems above 1 ft. high, slender. Leaves very narrow, glabrous. Panicle with few horizontally divaricate slender but rigid branches. Spikelets sessile or nearly so, scattered or clustered, horizontally divaricate or reflexed, about 8 lines long, very narrow, acute, almost terete, glabrous, 8 to 10-flowered, the rhachis not articulate. Flowering glumes closely appressed, rather obtuse, thin almost hyaline, the nerves scarcely conspicuous. Palea rather shorter, very narrow.—*Poa stenostachya*, R. Br. Prod. 181.

Hab.: Endeavour River, *Banks and Solander*; a single specimen in Herb. Banks.

20. ***E. bifaria***, (2-ranked) var. *australiana*. Only a few portions of the upper part of the stem seen. Nodes very shortly woolly. Leaf-sheath long, somewhat loose; ligula a line of short hairs. Lamina very narrow, involute, 3 to 3½ in. long (the upper leaf only seen). Peduncle or stem above the last leaf, slender, terete, smooth and glabrous, 4 in. long. Spike or raceme 5 in. long. Spikelets bifarious, very closely set upon the rhachis, nearly or quite sessile, erecto-patent, about 6 lines long, 16 to 20-flowered, slightly compressed. Glumes closely distichous, the lower ones sharply keeled, $\frac{3}{4}$ line long, somewhat acute, with hyaline ciliate margins. Palea hyaline with thickened margin. Grain ovoid, red, tuberculate, about $\frac{1}{4}$ line long.

Hab.: Walsh River, *R. C. Burton*.

My few specimens point to a close relationship to the *E. bifaria* of Duthie's Fodd. Grasses of N. India, therefore I have placed it as an Australian variety of that species.

78. ECTROSIA, R. Br.

(Turned outward.)

Spikelets with 1 or rarely 2 fertile flowers and 2 or more male flowers or empty glumes above them, in a terminal panicle, the rhachis of the spikelet articulate above the two outer glumes. Outer empty glumes unawned, the 2nd rarely with a short point; glume of the perfect flower with a prominent point or short awn, the upper glumes tapering into fine straight awns. Styles distinct. Grain enclosed in the thin or scarcely hardened glume and palea.

The genus is limited to Australia.

Panicle compact and dense, with short erect branches.

Flowering glume 1 line long, thin, notched, with an awn nearly as long as itself 1. *E. leporina*.

Panicle slender, loose, the short branches spreading.

Flowering glume about 1 line long, 3-nerved, tapering into a short point;

glumes of the fruiting spikelet squarrose 2. *E. Gulliveri*.

1. ***E. leporina*** (appertaining to a hare, whence "Hare's-tail," from its soft dense panicle), *R. Br. Prod.* 186; *Benth. Fl. Austr.* vii. 638. Hare's-tail Grass. A glabrous slender grass attaining 2 ft. more, but sometimes smaller. Leaves very narrow, ending in subulate points. Panicle narrow, dense, 3 to 6 in. long, the fine awns giving it much of the aspect of *Triraphis mollis*. Spikelets crowded along the short erect branches, often purplish, the very short pedicels often bearing a few long hairs. Outer glumes narrow, very acute, about 1 line long. Flowering glume nearly as long, narrow, hyaline, 1-nerved, slightly notched, with



F. Elliott, Lith.

Heterachne Brownii, Benth.

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a fine awn nearly as long as the glume. Terminal empty glumes usually 2 or 3, smaller than the flowering one but with longer fine awns.—Kunth, Revis. Gram. t. 69.

Hab.: Coen River, *R. Brown*; Cleveland Bay, *A. Cunningham*; between Norman and Gilbert Rivers, *Gulliver*; Cape York, *McGillivray*, *Daemel*; Endeavour River, *Banks and Solander*; Brisbane River, *F. v. Mueller*; Darling Downs, *Law*.

Var. *micrantha*. A smaller plant with setaceous leaves. Panicle looser, the spikelets much smaller, crowded on the short erect branches as in the smaller specimens of *E. leporina*.

Hab.: Between Norman and Gilbert Rivers, *Gulliver*.

2. *E. Gulliveri* (after T. A. Gulliver), *F. v. M. Fragm.* viii. 201; *Benth. Fl. Austr.* vii. 634. A slender erect annual of 6in. to 1ft., with setaceous leaves. Panicle narrow but loose, with spreading branches ciliate as well as the very short pedicels with a few long hairs. Spikelets spreading or reflexed. Outer glumes membranous, very pointed, about 1 line long. Flowering glumes 1 or 2, at first very similar to the outer ones, but in the fruiting spikelet rigid, ovate, 3-nerved at the base, tapering into a fine very spreading point, giving the spikelet a squarrose aspect. Terminal empty glumes 2 to 4, with longer points or awns but rarely exceeding 1 line.—Bail. Ill. Mono. Gr. Q. i.

Hab.: Between Norman and Gilbert Rivers, *Gulliver*.

The spikelets have frequently only 1 fertile flower but occasionally there are 2 fertile ones and a third male.—*Benth.*

79. HETERACHNE, Benth.

(Various glumed.)

Spikelets very flat, with 1 fertile flower and several empty glumes above it, nearly sessile and crowded in one or more globular heads, the rachis of the spikelet articulate only under the perfect flower, very flexuose and continuous above it. Glumes complicate, keeled, rather obtuse, unawned, 2 outer empty ones persistent, the rest of the spikelet falling away with the fruit. Palea nearly as long as the flowering glume, folded, with 2 broad dorsal wings. Styles short, distinct. Grain oblique or curved, enclosed in the glume and palea but free from them.

The genus is limited to the two Australian species, which appear more nearly allied to *Ectrosia* and *Elytrophorus* than to *Eragrostis*, but singular in the whole spikelet with the exception of the outer glumes forming as it were an appendage to the grain.—*Benth.*

Spikelets ovate, $2\frac{1}{2}$ to $3\frac{1}{2}$ lines long, with more than 6 upper empty glumes, in 1 or 2 heads, sessile in the leaf-sheaths or the upper one shortly pedunculate

Spikelets orbicular, scarcely $1\frac{1}{2}$ line diameter, with less than 6 upper empty glumes, in several globular small heads, forming a pedunculate interrupted spike

1. *H. Brownii*.

2. *H. Gulliveri*.

1. *H. Brownii* (after Dr. R. Brown), *Benth. Fl. Austr.* vii. 635. Stems 6in. to 1ft. high, rigid, simple or slightly branched, sometimes slender and almost filiform. Leaves convolute, narrow, with broad loose sheaths. Heads of spikelets few, sessile in the upper sheaths or the terminal one shortly pedunculate, very dense, about $\frac{1}{2}$ in. diameter and $\frac{1}{2}$ to 1 in. long. Spikelets nearly sessile, surrounded by a few loose hairs. Outer empty glumes persistent, rather smaller than the flowering ones. Deciduous part of the spikelet ovate, $2\frac{1}{2}$ to $3\frac{1}{2}$ lines long, the rachis slightly hairy on the persistent part, glabrous above the articulation, very much recurved and incurved above the flowering glume and flexuose between the upper ones which vary in number from 6 to 14, all empty or with a small palea in the lower ones, narrow, about 1 line long, mostly without lateral nerves, the keel narrowly winged. Palea rather shorter than the glume, the wings broad, hyaline and shortly ciliate.—*Poa abortiva*, R. Br. Prod. 181.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown* and *J. F. Bailey*.

2. **H. Gulliveri** (after T. A. Gulliver), *Benth. in Hook. Ic. Pl.* t. 1250; *Fl. Austr.* vii. 685. Stems branching at the base and under 6in. in the specimens seen. Leaves narrow. Heads of spikelets globular, 2 to 3 lines diameter, several sessile in a more or less interrupted pedunculate spike of 1 to 2in., the rhachis of the head hairy between the spikelets, the general axis glabrous. Spikelets almost sessile, orbicular, scarcely above 1 line diameter, almost entirely occupied by the flowering glume and palea, which are broader than in *H. Brownii*, the glume 8-nerved, the keel winged and shortly ciliate at the end, the wings of the palea thin but not hyaline, shortly ciliate. Outer empty glumes smaller, unequal, the lowest 1-nerved, the 2nd ~~3-nerved~~ but the keel not winged. Upper empty glumes 3 to 5, like the flowering one but narrower.

Hab.: Between Norman and Gilbert Rivers, *Gulliver*.

80. TRIRAPHIS, R. Br.

(Referring to the three needle-like awns of the flowering glume.)

Spikelets several-flowered, in a terminal panicle, the rhachis of the spikelet articulate above each glume, the terminal glume usually empty or with a male flower. Outer empty glumes unawned, entire or the 2nd occasionally notched with a short point in the notch. Flowering glumes with 3 narrow lobes tapering into straight awns, the central occasionally with a short lobe or point on each side, or all 3 reduced to small teeth. Palea narrow. Styles distinct. Grain enclosed in the thin or coriaceous glume and palea, free from them.

The genus is limited to Australia.

Panicle soft and dense. Flowering glumes hairy, with a pointed lobe or short awn on each side of the central awn 1. *T. mollis*.

Panicle loose. Flowering glumes coriaceous, with 3 entire awned lobes.

Stems and leaves glabrous. Outer glumes under 2 lines long. Flowering glumes shortly silky-pubescent 2. *T. pungens*.

1. **T. mollis** (soft), *R. Br. Prod.* 185; *Benth. Fl. Austr.* vii. 608. A glabrous rather slender erect grass attaining 2ft. but sometimes much smaller. Leaves long and narrow, ending in fine points. Panicle narrow, dense, 6 to 10in. long, with a soft look owing to the slender awns and hairs of the glumes. Spikelets crowded on the short erect branches, narrow, about $\frac{1}{2}$ in. long without the awns, with 8 to 10 or even more flowers. Glumes narrow, membranous, about $1\frac{1}{2}$ line long, the 2 outer empty ones glabrous, entire or the 2nd with a short tooth on each side of the point. Flowering glumes sprinkled with a few long hairs, the central capillary awn 3 to 4 lines long, with a pointed lobe or short awn on each side, the lateral awns rather shorter.—*F. v. M. Fragm.* viii. 108; *Turner Austr. Gr. Pl.*

Hab.: Thirsty Sound, *R. Brown*; Port Curtis, *M. Gillivray*; Rockhampton and neighbouring districts, *O'Shaney* and others.

2. **T. pungens** (pungent), *R. Br. Prod.* 185; *Benth. Fl. Austr.* vii. 604. A glabrous slender grass of about 2ft., branching at the base. Leaves chiefly in the lower part, very narrow and convolute, often subulate and rigid. Panicle loose but narrow, 3 to 4in. long. Spikelets 4 to 5 lines long without the awns. Outer empty glumes glabrous narrow, coriaceous, 3 lines long or rather more, entire. Flowering glumes shorter below the division, coriaceous, shortly silky-pubescent, the 3 awns nearly equal, all entire and slightly dilated and rigid at the base.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*.

81. *TRIODIA*, R. Br.

(Flowering glumes often 8-toothed.)

Spikelets several-flowered, paniculate, the rachis articulate above the outer glumes and between the flowering ones, hairy round them or glabrous. Glumes unawned, 2 outer empty ones acute, keeled, glabrous or the keel scabrous-ciliate. Flowering glumes usually shorter, unawned, the lower part rounded on the back, more or less 8-nerved at first, often hardened and nerveless in fruit, with 8 terminal 1 or 3-nerved lobes or teeth. Palea about as long as the entire part of the glume, with 2 prominent nerves. Ovary glabrous. Styles very short, distinct. Grain somewhat dorsally compressed, enclosed in the glume and palea, free from them.

The Australian species are all endemic.

Leaves very pungent, the sheaths usually viscid. Flowering glumes silky-ciliate, divided nearly to the middle into 3 lobes.

Panicle loose and spreading. Spikelets dark, $\frac{1}{2}$ in. long, 8 to 12-flowered.

Panicle narrow and dense. Spikelets pale-colored 3 to 4 lines long, about 6-flowered.

Panicle long narrow and dense. Spikelets pale-coloured, very numerous under 3 lines long, about 3-flowered.

Leaves very pungent, the sheaths not viscid. Flowering glumes silky-villous at the base, with 3 sets of 3 nerves each, leading to 3 small obtuse teeth.

1. *T. Mitchelli*.2. *T. pungens*.3. *T. Cunninghamii*.4. *T. irritans*.

1. ***T. Mitchelli*** (after Sir T. Mitchell), *Benth. Fl. Austr.* vii. 606. Warrego Spinifex. Leaves very nearly those of *T. pungens* but longer, nearly terete, pungent pointed, with viscid sheaths. Panicle very much looser, 8 to 4 in. long, with capillary branches more or less spreading, the lower ones 1 to 1½ in. with 3 or 4 pedicellate spikelets, the upper ones short with 1 or 2 spikelets. Spikelets dark-coloured, $\frac{1}{2}$ in. long when fully out, ovate or oblong, with 8 to 12 flowers. Outer glumes 8-nerved, obtuse or minutely 8-toothed, about 3 lines long. Flowering glumes 2½ lines long, 8-nerved, the entire part densely silky-villous and at length somewhat hardened, the 3 acute rigid glabrous lobes as long as the entire part or the central one rather longer. Palea glabrous.—*T. pungens*, Lindl. in Mitch. Trop. Austr. 840, not of R. Br.

Hab.: On the Maranoa, *Leichhardt*; near Mount Pluto, *Mitchell*; Warrego and Georgina.

This species is at times badly infested with *Ustilago segetum*, *Bull.*

2. ***T. pungens*** (pungent), *R. Br. Prod.* 182; *Benth. Fl. Austr.* vii. 606. A rigid scrubby more or less glutinous grass, creeping or decumbent and branching at the base, the flowering stem 1 to 2 ft. high. Leaves narrow, convolute, rigid, very acute or pungent-pointed, usually 3 to 6 in. long. Panicle 3 to 6 in. long, narrow and almost spikelike, the lower erect branches rarely 1 in. long. Spikelets 3 to 4 lines long, pale-coloured, with about 6 flowers. Outer glumes glabrous, acute, under 3 lines long. Flowering glumes rather shorter, the entire base broad, with long silky hairs at the base and margins, but few on the back, hardened and almost nerveless in fruit, the 8 lobes broad, glabrous, rigid, acute, nearly as long as the entire part, and each one more or less distinctly 8-nerved in the centre. Palea as long, the 2 nerves or keels very prominent or narrowly winged.—*Festuca viscida*, F. v. M. Veg. Chath. Isl. 59, *Fragm.* viii. 129.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*, *Henne*.

3. ***T. Cunninghamii*** (after A. Cunningham), *Benth. Fl. Austr.* vii. 606. Leaves 2 ft. high or more. Leaves convolute and rigid with the sheaths more or less viscid as in *T. pungens*, but much longer, and in one specimen the lower sheaths are ciliate with long silky hairs. Panicle narrow, dense, from a few

inches to 1ft. long. Spikelets under 3 lines long, very numerous, nearly sessile on the erect branches, mostly about 3-flowered. Flowering glumes scarcely exceeding the outer ones, hairy at the base, divided to near the middle into 3 acute lobes as in *T. pungens*, but very much smaller.

Hab.: Suttor Desert, *F. v. Mueller*; and other inland localities.

4. ***T. irritans*** (irritating), *R. Br. Prod.* 182; *Benth. Fl. Austr.* vii. 607. Porcupine Grass. A rigid scrubby glabrous grass, with long rigid convolute pungent-pointed leaves, not viscid in any of the specimens seen. Panicle narrow, almost spikelike, 8 to 6in. long. Spikelets solitary or few together on short erect capillary pedicels or branches, mostly 3 or 4-flowered, 4 to 5 lines long. Outer glumes glabrous, acute, 5-nerved, 3 lines long. Flowering glumes not quite so long, villous, with silky hairs at the base but much less so than in *T. pungens*, truncate at the end, with 3 sets of 3 nerves each leading to three very short obtuse or truncate lobes or teeth, the lateral ones rather broad, the central one smaller or minute. Palea narrow.—*Festuca irritans*, *F. v. M. Veg. Chath. Isl.* 59, *Fragm.* viii. 129.

Hab.: Southern inland localities.

82. DIPLACHNE, Beauv.

(Referring to the 2-lobed flowering glume.)

Spikelets several, often many flowered, linear, sessile or very shortly pedicellate, but distant along the rhachis of a simple spike or of the elongated branches of a simple panicle, the rhachis of the spikelet articulate and usually hairy under the flowering glumes. Outer empty glumes keeled, acute, unawned; flowering glumes with a hyaline shortly 2-lobed apex, the keel produced into a short point or awn between or shortly below the lobes. Palea thin, prominently 2-nerved. Styles short, distinct, Grain smooth, free.

A genus of few species, generally spread over the warmer regions of the globe.

Spikes slender, simple 1. *D. loliiformis*.

Spikes numerous in a simple panicle.

Spikelets pale-coloured, 5 to 8 lines long, 8 to 12-flowered. Rhachis with a tuft of long hairs under the glumes 2. *D. Muellieri*.

Spikelets usually dark-coloured, 4 lines long or rather more, with more than 6-flowers, rhachis glabrous, or nearly so 3. *D. fusca*.

1. ***D. loliiformis*** (*Lolium*-like), *F. v. M.*; *Benth. Fl. Austr.* vii. 618. A slender apparently annual erect grass, usually 6 to 8in. high but sometimes more. Leaves chiefly at the base, short and narrow, usually sprinkled with a few long hairs, the sheaths ciliate at the orifice, with a short jagged ligula. Spike slender and simple, 2 to 4in. long, on a long peduncle. Spikelets sessile, rather distant, erect and appressed, turned somewhat to one side, narrow, 3 to 4 lines long, 6 to 12-flowered, the rhachis hairy round the flowering glumes. Flowering glumes about 1 line long, glabrous, 3-nerved, the central nerve produced into a fine point or awn shortly exceeding the hyaline lobes.—*Festuca* or *Leptochloa loliiformis*, *F. v. M. Fragm.* viii. 128.

Hab.: Moreton Bay and Charley's Creek, *Leichhardt*; various localities about Rockhampton, *Boorman*, *O'Shanesy*.

2. ***D. Muellieri*** (after Baron *F. v. Mueller*), *Benth. Fl. Austr.* vii. 619. A glabrous erect grass of about 1½ft. nearly allied to *D. fusca*, with a similar foliage and inflorescence, but the spikelets fewer, pale-coloured, 5 to 8 lines long, with 8 to 12 flowers. Flowering glumes surrounded by a tuft of rather long hairs and

the margins ciliate below the middle, the point of the keel scarcely rounded by the hyaline margins, and the lateral nerves occasionally produced into minute points. Grain narrow-obovate, flattened.

Hab.: Some years ago I received fragmentary specimens from Mr. Alfred Henry, Georgian River, of a grass which appeared to belong to this species.

8. **D. fusca** (brownish), Beauv. *Agrost.* 168; *Benth. Fl. Austr.* vii. 619. A glabrous erect grass of several feet. Leaves narrow, convolute when dry, with long loose sheaths, the ligula jagged. Panicle narrow, 6 in. to 1 ft. long, with erect branches, the lower ones long. Spikelets sessile or nearly so, rather distant, erect, linear, 6 to 10-flowered, about 4 lines long or rather more and straw-coloured, or longer and dark, the rhachis glabrous or slightly hairy under each glume. Flowering glumes nearly 2 lines long, shortly ciliate on the margins in the lower part, prominently 8-nerved, the keel produced into a short point between or just below the short hyaline terminal lobes. Keels of the palea shortly ciliate. —Turner *Austr. Gr. Pl.*; *Festuca fusca*, Linn.; F. v. M. *Fragm.* viii. 127; *Leptochloa fusca*, Kunth, *Enum.* i. 271; *Triodia ambigua*, R. Br. *Prod.* 188; *Uralapis fusca* and *U. Drummondii*, Steud. *Syn. Glum.* i. 247.

Hab.: Keppel Bay, R. Brown; Bokhara Flats, Leichhardt; and Brisbane River.

An annual succulent grass, often met with in brackish swamps, where it affords a good fodder, greedily devoured by stock.

88. CENTOTHECA, Desv.

(Referring to the prickly glumes).

Spikelets several (usually 8) flowered, flat, all pedicellate in a loose spreading panicle, the rhachis of the spikelet slender, inarticulate, glabrous. Glumes acute or minutely pointed, unawned, keeled, the lowest flowering glume close above the 2 outer empty ones and like them glabrous, the upper flowering ones bearing on the marginal nerves a few rigid bristles at first erect, at length reflexed. Palea 2-keeled. Ovary glabrous. Styles distinct, short. Grain oblong, not furrowed, free.

The genus is limited to the single Australian species, generally spread over New Guinea, tropical Asia and Africa.

1. **C. lappacea** (burr-like), Desv.; Kunth, *Enum.* i. 366, *Revis. Gram.* t. 70; *Benth. Fl. Austr.* vii. 640. An erect glabrous grass of many feet. Leaves flat, $\frac{1}{2}$ to $\frac{3}{4}$ in. broad, the numerous parallel nerves very prominent; ligula short, ciliate short, ciliate or jagged. Panicle terminal, 8 to 10 in. long and as broad when open, the capillary branches slightly divided. Spikelets 8 to 4 lines long, green. Lowest empty glume a little more than 1 line, the 2nd $1\frac{1}{2}$ line long; flowering glumes a little larger, the rhachis produced into a short point beyond the uppermost one, or bearing a small terminal empty glume. Flowers within the glumes often distinctly stipitate with the palea inserted on the stipes. —Beauv. *Agrost.* t. 14, f. 7.

Hab.: Daintree River, Fitzalan; Johnstone River, Gulliver; all tropical scrubs.

Var. *biflora*. Spikelets smaller with only 2 flowering glumes, the lowest glabrous like the outer ones, the upper one alone setiferous.

Hab.: Rockingham Bay, Dallachy.

84. *DACTYLIS, Linn.

(Panicle supposed to resemble the fingers of the hand).

Spikelets several-flowered, sessile and densely crowded in thick one-sided clusters, arranged in a short irregular spike or at the ends of the short branches of a dense irregular one-sided panicle. Flowering glumes 8 or 5-nerved, the keel prominent and produced into a point or short awn. Grain free, concave or broadly furrowed.

The genus is limited to a single species common in Europe, temperate Asia and North Africa.

1. ***D. glomerata*** (crowded), *Linn.*; *Kunth, Enum. i. 386*; *Benth. Fl. Austr. vii. 640*. **Cock's-foot Grass.** A coarse stiff grass of 1 to 2ft., the perennial stock forming at length dense tufts. Clusters of spikelets dense and ovoid, sometimes collected into a close spike of about 1in., sometimes in a broken spike of several inches or on the branches of a short, more or less spreading panicle. Each spikelet much flattened, 3 to 5-flowered. Flowering glumes lanceolate, 2 to 2½ lines long, ciliate on the back, outer glumes rather shorter, narrow, with a prominent ciliate keel.—*Reichb. Ic. Fl. Germ. t. 59*; *F. v. M. Fragm. viii. 126*.

Hab.: Europe, naturalised in a few southern localities.

85. ***BRIZA**, *Linn.*

(From its nodding spikelets.)

Spikelets several-flowered, broad, flattened but thin, on filiform pedicels, in a simple or compound panicle, the rhachis of the spikelet glabrous. Flowering glumes imbricate but spreading, very broad, membranous or scarious, very concave or inflated, unawned. Palea much smaller but very broad and flat. Grain obovate, concave in front, enclosed in the palea and almost vesicular glume, free from them.

A small genus widely spread in its typical form over the temperate regions of the northern and southern hemispheres.

Panicle branched, rather loose and spreading. Spikelets scarcely 2 lines long and broad 1. *B. minor*.

Panicle nearly simple with few spikelets ½in. long and at least 4 lines broad 2. *B. maxima*.

1. ***B. minor*** (small), *Linn.*; *Kunth, Enum. i. 372*; *Benth. Fl. Austr. vii. 660*. **Small Quaking Grass.** An erect annual, from a few inches to about 1ft. high. Leaves rather short, flat, the ligula scarious and often above 8 lines long. Panicle usually 2 to 3in. long, much branched and at length spreading, with numerous thick spikelets about 2 lines long and as broad or at length broader.—*Reichb. Ic. Fl. Germ. t. 92*; *F. v. M. Fragm. viii. 125*; *B. virens*, *Linn.*; *Nees in Pl. Preiss. ii. 107*.

Hab.: Probably of Mediterranean origin. Naturalised in Southern localities.

2. ***B. maxima*** (largest), *Linn.*; *Kunth, Enum. i. 371*; *Benth. Fl. Austr. vii. 660*. **Large Quaking Grass.** An erect annual of 1 to 2ft. Leaves flat, with a rather long ligula. Panicle almost simple, with few large hanging spikelets usually of a rich brown rarely pale green, mostly about ½in. long, very obtuse, 4 to 5 lines broad.—*Reichb. Ic. Fl. Germ. t. 92*; *F. v. M. Fragm. viii. 125*.

Hab.: A European species, not so widely spread as *B. minor*, but long since cultivated in gardens for ornament and now established in a few southern localities.

86. **POA**, *Linn.*

(Greek word for grass.)

Spikelets several, usually few-flowered in a panicle usually loose and spreading, rarely narrow and spikelike, the rhachis of the spikelet articulate between the 1 or 3-nerved, sometimes acute, the flowering ones usually obtuse, 5-nerved, often flowering glumes. Glumes keeled, unawned, the outer empty ones rather short, surrounded by a few loose woolly hairs, rarely with 7 or more nerves. Palea nearly as long, prominently 2-nerved or 2-keeled. Grain enclosed in the glume and palea and falling off with them, but free or rarely adnate to the palea.

The genus is the most widely diffused over the globe in the whole Order, chiefly in temperate and cool regions, reaching the Arctic circle and Alpine summits.

Perennials. Grain enclosed in the glume and palea, but free from them.

Leaves setaceous or rigid and convolute or flat, ending in long points.

Panicle dense and contracted or spreading. Spikelets usually 4 to 6-flowered. Glumes and palea glabrous, or with woolly-hairs at the base.

1. *P. caespitosa*.

Leaves flat, narrow, acuminate. Panicle rather dense. Spikelets 5 to 8-flowered, the keels of the glumes ciliate-pubescent. Stems knotty at the base.

2. *P. nodosa*.

Annual. Leaves flat, flaccid.

Panicle loose. Spikelets 2 lines long. Flowering glumes 5-nerved, glabrous or minutely silky hairs.

3. *P. *annua*.

1. ***P. caespitosa*** (tufted), *Forst.: Spreng. Mant. i. Fl. Hal. 83, and in Mem. Acad. Petersb. ii. (1807-8), 302, t. 8; Benth. Fl. Austr. vii. 651.* An exceedingly variable species from under 1ft. to 3ft. high, usually densely tufted and glabrous. Leaves narrow, flat, convolute or setaceous, chiefly at the base, sometimes longer than the inflorescence, sometimes very short, the ligula always very short or obsolete. Panicle branched, compact or spreading. Spikelets usually 4 to 6-flowered. Flowering glumes usually surrounded by a few fine woolly hairs but sometimes the whole spikelet glabrous, the cilia of the palea-keels when present very minute. Grain oblong, usually narrow, enclosed in the glume and palea but free from them.—*P. australis*, *P. lavis*, *P. plebia*, and *P. affinis*, R. Br. *Prod. 179; P. australis*, Hook. f. *Fl. Tasm. ii. 128.*

Hab.: Districts bordering on N.S. Wales, *Beckler, Bailey.*

A most variable grass as to size, sometimes forming large tuessac-like tufts, at other times it has but a delicate growth. It is, however, a valuable pasture grass, and readily eaten by all kinds of stock.

Var. latifolia. Very tall and luxuriant, with flat leaves often 2 to 4 lines broad.

This is a tall luxuriant grass, well worthy of cultivation; its broad leaves and large panicles of flowers remind one somewhat of the Guinea-grass. It seems to be naturally a mountain grass; its only known Queensland habitat is summit of Mount Mistake Range.

2. ***P. nodosa*** (knotted), *Nees in Pl. Preiss. ii. 105; Benth. Fl. Austr. vii. 658.* Stems usually about 2ft. high, forming at the base 1, 2 or 3 superposed globular or ovoid nodules, 3 or 4 lines diameter. Leaves long, narrow, flat, usually scabrous. Panicle loose, narrow or spreading. Spikelets 3 to 4 lines long, 5 to 8-flowered, rather narrow at first with closely appressed glumes, at length broad and flat, the glumes spreading out. Flowering glumes about 2 lines long, 5-nerved, without the woolly hairs at the base of most *Poas*, but shortly ciliate-pubescent at the keel and margins below the middle. Palea nearly as long, the keels minutely ciliate-pubescent or glabrous. Grain free.—*F. v. M. Fragm. viii. 182; P. brizochloa*, *F. v. M. in Trans. Vict. Inst. 1855, 45; P. Drummondiana*, *Nees in Hook. Lond. Journ. ii. 418; P. cognata*, *Steud. Syn. Glum. i. 262.*

Hab.: Recorded for Queensland by *F. v. M.*

When fully out the spikelets are broad almost like those of a *Briza*, but sometimes they are lanceolate close and rather thick, but apparently the difference is owing to a different stage of development rather than to any distinction of race.—*Benth.*

3. ***P. *annua*** (annual), *Linn.; Kunth, Enum. i. 849; Benth. Fl. Austr. vii. 654.* A tufted annual, often only 2 or 3in., and rarely 1ft. high. Leaves flat, flaccid. Panicle loose and spreading. Spikelets shortly pedicellate, about 2 lines long, 3 to 6-flowered, the rhachis glabrous. Flowering glumes more or less distinctly 5-nerved, with a hyaline apex, the keel often minutely silky-hairy. Grain free, oblong.

Hab.: A common grass in the northern hemisphere. A naturalised weed in various southern localities.

87. GLYCERIA, R. Br.

(Referring to the sweet herbage.)

Spikelets several-flowered, pedicellate in a narrow or spreading panicle, the rhachis of the spikelet articulate under the flowering glumes, glabrous or rarely hairy. Outer empty glumes obtuse or acute, unawned. Flowering glumes

convex on the back, 8 to 9-nerved, the nerves not reaching to the hyaline obtuse sometimes slightly denticulate apex. Palea nearly as long as the glume. Ovary glabrous. Styles distinct, very short, the plumose stigmas frequently more branched than in other genera. Grain glabrous, enclosed in the glume and palea but free from them.

The genus is widely distributed over the temperate and some warmer regions of the globe.

Brown called attention to two remarkable characters in the typical species, the union of the two lodicules, and the ramification of the stigmatic hairs, which are most marked in the *G. fluitans* and exist to a certain degree in some other species. They are, however, as far as has been observed, not constant in all the species which have been included in the genus, which requires further revision in connection with some closely allied ones from the northern hemisphere.—*Benth.*

Flowering glumes with a tuft of hairs round the base or on the back below the middle. Panicle loose

Rhachis and base of the flowering glumes glabrous or minutely pubescent.

Stems rarely 8ft. high. Panicle narrow.

Panicle long and loose. Spikelets $\frac{1}{2}$ to 1in. Flowering glumes distant, narrow, 3 lines long, outer glumes much shorter

Panicle dense. Spikelets few, broad, $\frac{1}{2}$ to $\frac{3}{4}$ in. Flowering glumes paleaceous, 3 to 4 lines long, outer glumes as long

Stems very rigid, tall with few short leaves and often clusters of short branches. Flowering glumes hyaline, 3-nerved at the base.

Panicle very spreading. Spikelets 6 to 12-flowered 4. *G. ramigera*.

1. *G. Fordeana* (after Mrs. H. Forde), *F. v. M. Fragm.* viii. 180; *Benth. Fl. Austr.* vii. 657. An erect glabrous grass attaining 2 or 8ft. Leaves flat, very scabrous. Panicle very loose, compound, 4 to 8in. long, with very spreading capillary branches, mostly in pairs or threes. Spikelets lanceolate, mostly 4 to 5 lines long, 8 to 12-flowered. Outer glumes acute, 8-nerved; flowering glumes 5 or 7-nerved, $1\frac{1}{2}$ lines long, surrounded by a tuft of hairs and shortly hairy or pubescent in the lower part, the midrib prominent but not reaching the obtuse hyaline apex, the lateral nerves shorter. Palea-keels scarcely ciliate.—*Poa Fordeana*, *F. v. M. l.c.*

Hab.: Recorded for Queensland by *F. v. M.*

2. *G. fluitans* (floating), *R. Br. Prod.* 179; *Benth. Fl. Austr.* vii. 657. Stems creeping in mud or floating at the base, ascending to 2 or 8ft. Leaves narrow, flat, glabrous, the ligula jagged. Panicle loose, long and narrow. Spikelets solitary in the distant notches or 2 or 3 on a short branch from the same notch, erect, narrow, $\frac{1}{2}$ to 1in. long, 6 to 20-flowered, the rhachis glabrous as well as the glumes. Outer glumes broad, obtuse, hyaline, faintly nerved at the base, the lowest about $1\frac{1}{2}$ lines, the 2nd longer; flowering glumes more rigid, about 3 lines long, with about 7 nerves not reaching to the hyaline obtuse entire or slightly denticulate apex. Lodicules usually connate.—*Hook. f. Fl. Tasm.* ii. 122; *Reichb. Ic. Fl. Germ.* t. 80; *Turner Ag. Gaz. N.S.W.* ii.; *Festuca fluitans*, *Linn.*; *F. v. M. Fragm.* viii. 129.

Hab.: Southern border towards Wallangarra.

The species is abundant in the northern hemisphere, in the New as well as the Old World.

3. *G. latispicea* (spikelets broad), *F. v. M. Fragm.* viii. 127; *Benth. Fl. Austr.* vii. 659. Stems erect, attaining 2 or 8ft. Leaves flat, glabrous, the ligula long and jagged. Panicle narrow, the branches very short, erect, each bearing 1 to 3 spikelets, the lower ones distant. Spikelets rather broad and loose, $\frac{1}{2}$ in. long or rather more, pale-coloured, 6 to 12-flowered, the rhachis as well as the glumes glabrous or very minutely hairy. Outer glumes obtuse, 5-nerved; flowering ones 8 to 4 lines long, 7 or 9-nerved, rounded on the back as in the rest of the genus but the midrib reaching the obtuse, hyaline apex, the lateral nerves faint and shorter. Grain oblong, flattened but concave on the inner face.—*Festuca latispicea*, *F. v. M. l.c.*

Hab.: Southern border towards Wallangarra.

4. **G. ramigera** (branched); *R. v. M. Fragm.* viii. 181; *Benth. Fl. Austr.* vii. 659. A tall glabrous rigid almost Bamboo-like grass, branched at the base and often bearing clusters of branches higher up. Leaves convolute and flat, few and short on the flowering stems. Panicle 4 to 8 in. long, loosely ovate or at length very spreading. Spikelets rather numerous, usually 3 to 5 lines long with 6 to 12 flowers, but sometimes longer, the rhachis glabrous. Outer glumes narrow, hyaline, acute, faintly 1-nerved; flowering glumes distant, about $1\frac{1}{2}$ line long, broad and concave, hyaline, 3-nerved, the nerves all short, the central one not reaching much above the middle.—*Poa ramigera*, *F. v. M.* in *Trans. Vict. Inst.* 1855; 45 and *Fragm.* l.c.

Hab.: Recorded for Queensland by *F. v. M.*

88. FESTUCA, Linn.

(Said to be derived from a Celtic word signifying pasture or food.)

Spikelets several-flowered, pedicellate, in loose and spreading or compact and erect more or less one-sided panicles, the rhachis of the spikelet articulate under the flowering glumes, glabrous or nearly so. Outer empty glumes narrow, acute, keeled, usually unequal. Flowering glumes narrow, acute or tapering into an untwisted awn or rarely obtuse, rounded on the back, faintly nerved, Palea narrow, with prominent nerves or keels. Ovary glabrous. Styles very short, distinct. Grain enclosed in the glume and palea and more or less adnate.

The genus is very generally spread over the globe especially in temperate or mountainous regions.

Annual. Panicle slender, contracted, one-sided. Awns long. Stamen usually 1 only

1. *F. bromoides*.

Panicle narrow, dense and spikelike or interrupted; the leaves long, erect and rigid

2. *F. littoralis*.

1. **F. bromoides** (Bromus-like), *Linn.*; *Kunth, Enum.* i. 396; *Benth. Fl. Austr.* vii. 663. A slender tufted annual, from a few inches to above 1 ft. high. Leaves chiefly at the base, narrow and convolute, often quite setaceous. Panicle slender, one-sided, contracted, usually rather dense and 2 to 6 in. long, with short erect branches, in small specimens reduced to 2 or 3 spikelets. Spikelets shortly pedicellate, under $\frac{1}{2}$ in. long without the awns, 5 to 9-flowered. Glumes very narrow, the lowest under 2 lines without lateral nerves, the 2nd empty one 3-nerved, tapering to a point or short awn; flowering glumes obscurely nerved, about 3 lines long, tapering into a fine awn at least as long as themselves. Stamen 1 only. Grain adnate, long and narrow.—*Hook. f. Fl. Tasm.* ii. 127; *F. plebeia*, *R. Br. Prod.* 178.

Hab.: Brisbane River, *Bailey*.

Common in the temperate regions of the Northern hemisphere.

2. **F. littoralis** (a coast plant), *Labill. Pl. Nov. Holl.* i. 22, t. 27. Stems 1 to 3 ft. high forming dense hard tufts of a pale yellow colour. Leaves nearly cylindrical, erect, rigid, pungent-pointed, glabrous, often as long as the stems. Panicle narrow, dense and spikelike, 2 to 4 in. long. Spikelets few, flat, erect, 7 to 9 lines long, 6 to 8-flowered. Glumes about 4 lines long, rigid, straw-coloured, the flowering ones with 2 nerves on each side of the keel, acute or dilated and notched at the tip, the keel usually slightly protruding, the 2 outer empty ones narrower, 8-nerved, acute. Rhachis of the spikelet shortly hairy.—*R. Br. Prod.* 178; *Hook. f. Fl. Tasm.* ii. 128; *Sieb. Agrostoth.* n. 58; *Arundo triodioides*, *Trin. Spec. Gram.* t. 351; *Schedonorus Billardierianus*, *Nees* in *Hook. Lond. Journ.* ii. 419; *S. littoralis*, *Beauv. Agrost.* 99; *Benth. Fl. Austr.* vii. 655.

Hab.: Moreton Island, *F. v. Mueller*.

89. **BROMUS**, Linn.

(Greek name for the Wild-Oat.)

Spikelets several-flowered, oblong or lanceolate, pedicellate, erect or drooping, in a more or less branched panicle, the rachis of the spikelet articulate between the flowering glumes, glabrous or scabrous pubescent. Outer empty glumes acute or fine-pointed, unawned. Flowering glumes convex on the back, 5 or 7-nerved, the hyaline, apex usually shortly bifid, the midrib produced into a straight or curved awn free from a little below the apex. Palea nearly as long as the glume, the 2 prominent nerves usually scabrous-ciliate. Ovary obovate, crowned by a hairy membranous appendage, the very short distinct styles more or less lateral. Grain flattened, adhering to the palea, and often more or less to the base of the glume.

The genus is widely distributed over the temperate regions of the globe.

Spikelets flat, many-flowered, in a branching panicle. Glumes complicate keeled, several-nerved, acute, or the flowering ones shortly awned . . .
Spikelets lanceolate, flattened, 1 to 1½ in. long with the awns. Flowering glumes narrow, loosely imbricate . . .
Spikelets linear-lanceolate, flattened 2 in. long with the awns. Flowering glumes narrow, loosely imbricate . . .

1. *B. *unioloides*.
2. *B. arenarius*.
3. *B. sterilis*.

1. ***B. *unioloides*** (Uniola-like) *H. B. K.; Kunth, Enum. i. 415*. Prairie Grass. An erect grass of 2 ft. or more. Leaves more or less pubescent, with soft spreading hairs. Panicle loose, erect or at length drooping, like that of a *Bromus*. Spikelets lanceolate, resembling those of the North American *Uniola*, $\frac{3}{4}$ to 1½ in. long, and the flowering glumes about $\frac{1}{2}$ in.—*Festuca unioloides*, Willd. Hort. Berol. 3, t. 3; *Bromus Willdenowii*, Kunth, l.c. 416; *Ceratochloa festuoides*, Beauv. Agrost. 75, 158, t. 15, f. 7; *Ceratochloa unioloides*, DC. Cat. Hort. Monsp. 92; Benth. Fl. Austr. vii. 662; *F. Schraderi*, Kunth; Duthie Grass, N.W. Ind. 49; Fodd. Grass N. Ind. 67.

Hab.: An American plant, chiefly western now naturalised in southern localities.

2. ***B. arenarius*** (found on sandy land), *Labill. Fl. Nov. Holl. i. 23, t. 28; Benth. Fl. Austr. vii. 661*. Barley Grass. Apparently annual, from 1 ft. to about 1½ ft. high. Leaves flat, flaccid, softly hairy or pubescent. Panicle at first erect at length drooping, the capillary branches clustered, the longer ones 2 to 3 in. long with 1 to 4 spikelets on capillary pedicels. Spikelets lanceolate, $\frac{1}{2}$ to $\frac{3}{4}$ in. long without the awns, flat, 5 to 9-flowered. Glumes all pubescent or glabrous, the lowest about 3 lines long and 5-nerved, the 2nd longer and 7-nerved, both empty and acute; flowering glumes rather longer, about 7-nerved, convex on the back, the awn free from a little below the scarious tip, $\frac{1}{2}$ to $\frac{3}{4}$ in. long.—Bail. Ill. Mono. Gr. Q. i.; Turner Austr. Gr. 15; *B. australis*, R. Br. Prod. 178; Nees in Pl. Preiss. ii. 108.

Hab.: Common on the southern downs.

Often called Oat Grass. It is a winter or early spring grass, and considered a good kind by many of our sheep farmers especially on the inland plains.

Munro thinks the species may be the same as the *B. japonicum*, Thunb. If this should be verified Thunberg's name would take precedence over Labillardière's.—Benth.

3. ***B. *sterilis*** (sterile), *Linn.; Kunth, Enum. i. 418; Benth. Fl. Austr. vii. 662*. An erect grass of 1 to 2 ft. Leaves flaccid, softly pubescent. Panicle loose with rather long erect at length drooping branches. Spikelets linear-lanceolate, mostly about 1 in. long without the awns, 6 to 8-flowered. Outer glumes narrow, ending in fine points, the lowest keeled, only $\frac{1}{2}$ to $\frac{3}{4}$ in. long, the 2nd longer, 8-nerved. Flowering glumes mostly 5 or 7-nerved, the hyaline tips ending in 2 fine points. Awn much longer than the glume itself, very scabrous.—Reichb. Ic. Fl. Germ. t. 73.

Hab.: A weed of cultivation in southern localities.

A common grass in Europe.

90. ***LOLIUM**, Linn.

(Said to be from the Celtic name.)

Spikelets several-flowered, singly sessile in the alternate notches on opposite sides of a simple spike, the edge of the spikelet (the backs of the glumes of one row) next the common rhachis, the rhachis of the spikelet glabrous. Glumes nearly similar, one outer one in the lateral spikelets empty and rather larger, or sometimes longer than the whole spikelet, in the terminal spikelet 2 outer ones empty.

A genus of very few species, natives of the temperate regions of the Northern hemisphere.

Outer glume shorter than the spikelet. Flowering glumes narrow, lanceolate, without any or with very short awns

Outer glume usually as long as or longer than the spikelet. Flowering glumes oblong, some or all usually with an awn as long as or longer than themselves 1. *L. perenne*.
 2. *L. temulentum*.

1. ***L. perenne*** (perennial), Linn.; Kunth, *Enum.* i. 436; Benth. *Fl. Austr.* vii. 666. Perennial Rye Grass. An erect or slightly decumbent glabrous grass of 1 to 2ft., sometimes annual but usually lasting several years. Spikes distichous, from a few inches to 1ft. long. Spikelets at a considerable distance from each other on alternate sides of the rhachis. Outer glume of the lateral spikelets and 2 outer ones of the terminal one, empty, rigid, strongly nerved, longer than the others but much shorter than the spikelet. Flowering glumes 8 to 16 or even more, narrow, obtuse or acute, with the keel and 2 lateral nerves prominent, sometimes produced into a very short awn. In cultivation there are sometimes several outer empty glumes.—Reichb. Ic. Fl. Germ. t. 6; F. v. M. *Fragm.* viii. 127.

Hab.: Only met with as a stray from cultivation in the most southern parts.

2. ***L. temulentum*** (drunken), Linn.; Kunth, *Enum.* i. 437; Benth. *Fl. Austr.* vii. 667. Drunken Darnel. Usually taller than *L. perenne* and always annual. Outer glume of the lateral spikelets usually as long as or longer than the whole spikelet. Flowering glumes shorter and broader than in *L. perenne*, oblong, usually obtuse, with an awn as long as or longer than the glume itself. In some specimens however most of the glumes are awnless or very rarely the whole spikelet without awns.—Reichb. Ic. Fl. Germ. t. 5; F. v. M. *Fragm.* viii. 127.

Hab.: Only met with as a stray from cultivation. The Tares of Scripture.

91. **LEPTURUS**, R. Br.

(Referring to the axis of the spikelet being produced into a point.)

Spikelets 1-flowered, sessile and half embedded in the alternate notches of a more or less articulate simple spike. Outer empty glumes 2, one slightly overlapping the other on one side, or 1 only, appressed and covering the cavity, rigid and nerved. Flowering glume and palea shorter than and hyaline, embedded in the cavity, the axis of the spikelet produced behind the palea into a minute point or bearing a small terminal empty glume. Styles short. Grain free from the glume.

A genus of few species, chiefly from the Mediterranean region.

1. ***L. repens*** (creeping), R. Br. *Prod.* 207; Benth. *Fl. Austr.* vii. 668. A perennial creeping in the sands sometimes to a considerable extent, with divaricately branching stems. Leaves spreading, glaucous and glabrous or ciliate at the orifice of the sheaths. Spikes close upon the last leaf-sheath, 2 to 3in. long, the articulate rhachis breaking much more readily than in some other species and therefore very rarely perfect in dried specimens. Spikelets usually

about 4 lines long without the point. Outer glume closely appressed, almost embraced by the margins of the cavity, finely many-nerved, tapering into a short or long point, 2nd glume thin and hyaline, acute, concave, enclosing a palea nearly as long and a hermaphrodite flower, the rhachis of the spikelet shortly continued at the back of the palea and bearing a small thin hyaline empty glume. —Brongn. in Duperr. Voy. Bot. 57, t. 16.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*; Bird Islet, Wreck Reef, *Denham*; Raine Island, Cape York, *Challenger Expedition*; and many other localities on the tropical coast.

Also in the islands of the South Pacific.

92. *TRITICUM, Linn.

(The old name of wheat.)

Annual or biennial grasses. Leaves flat. Spikelets few-flowered, tumid, sessile, distichously spicate, solitary, with their sides opposite cavities in the articulate or inarticulate rhachis; upper flowers male or neuter. Glumes rigid, often unequal-sided, 1st and 2nd empty, obtuse or shortly awned, few-nerved, persistent; flowering glumes oblong or ventricose, dorsally rounded or keeled above, awnless or 1 to 3-awned, 5 to 9-nerved, lateral nerves not conniving with the central; keels of palea ciliate. Lodicules entire, ciliate. Stamens 8. Styles very short. Grain grooved ventrally, often hairy, free or adherent to the palea.

Species few, Oriental.

1. **T. vulgare** (common), *Vill. Hist. Pl. Damph.* ii. 158; *Hook. in Fl. Brit. Ind.* vii. 867. The Common Wheat.—*T. sativum*, Lam.

Hab.: Met with as a stray from cultivation.

Attacked by the following fungi:—The plant by *Ustilago segetum*, *Bull.* and *Puccinia graminis*, *Pers.*; the ear by *Fusarium heterosporum*, *Link.*; the grain by *Tilletia caries*, *Tul.*

93. AGROPYRUM, Beauv.

(From *agros*, a field, and *pyros*, wheat; closely allied to the wheat.)

Spikelets several-flowered, more or less flattened, distichous and alternately sessile on the continuous or slightly notched rhachis of a simple spike, one face of the spikelet next the general rhachis, the rhachis of the spikelet more or less articulate under the flowering glumes. Glumes rounded on the back or scarcely keeled, tapering into points or awns, the flowering ones 3 to 7-nerved, the 2 outer empty ones usually shorter, narrower, 8 or rarely 1-nerved. Palea nearly as long as the glume, the 2 prominent nerves almost marginal, scabrous-ciliate. Ovary pubescent at the top. Styles short, distinct. Grain free or slightly adhering to the palea.

The genus is widely spread over the temperate regions of the globe.

1. **A. scabrum** (rough), *Beauv. Agrost.* 102; *Benth. Fl. Austr.* vii. 665. Very variable as to stature, sometimes under 1ft. high, slender with short filiform leaves and from that to 8 or 4ft. with narrow spreading flat or convolute leaves. Spike usually 6in. to 1ft. long, the rhachis scarcely notched. Spikelets distant, sessile, erect, $\frac{3}{4}$ to 1in. long without the awns, narrow, 6 to 20-flowered; in the small specimens sometimes only 1 or 2 spikelets. Glumes narrow, rigid, straw-coloured, mostly about 5-nerved, not distinctly keeled, the 2 outer empty ones rather shorter, tapering into short points, the flowering ones 4 to 6 lines long without the awns, tapering into fine straight or at length spreading awns mostly longer than the glumes and sometimes above 1in. long; those of the upper and of the lower glumes often not so long as the intermediate ones. Palea obtuse.—*Turner Ag. Gaz. N.S.W.* ii.; *Festuca scabra*, *Labill. Pl. Nov. Holl.* i. 22, t. 26; *Triticum scabrum*, *R. Br. Prod.* 178; *Hook. f. Fl.*

Tasm. ii. 128; *Vulpia rectisecta* and *V. Browniana*, Nees in Pl. Praies, ii. 107; *V. scabra* and *V. Browniana*, Nees in Hook. Lond. Journ. ii. 419; *Festuca rectiseta*, *F. Browniana*, and *F. Billardieri*, Steud. Syn. Glum. i. 304; *Anthosacne australasica*, Steud. l.c. 287.

Hab.: Moreton Bay, *Leichhardt*, *C. Stuart*; Warwick, *Beckler*; Suttor Desert, *F. v. Mueller*; affording good herbage during winter and early spring.
Also in New Zealand.

94. *HORDEUM, Linn.

(An old name of Barley.)

Spikelets 1-flowered, 3 together sessile or nearly so in the alternate notches of the rhachis of a dense cylindrical spike, the central flower hermaphrodite, those of the lateral spikelets usually male or neuter. Outer empty glumes 2, subulate or slightly flattened, tapering into straight awns or awnlike from the base. Flowering glume inserted rather higher up, convolute round the flower with a straight terminal awn. Palea 2-ribbed. Ovary crowned by a tuft of hairs. Stigmas nearly sessile.

A genus of few species, mostly of Mediterranean origin, dispersed over the temperate and subtropical regions of both hemispheres.

Outer empty glumes of the central spikelets more or less dilated and ciliate

in the lower half 1. *H. murinum*.
Spikelets 2 to 6-ranked, flowering glume long awned 2. *H. vulgare*.

1. ***H. murinum*** (of walls), *Linn.*; *Kunth*, *Enum.* i. 456; *Benth. Fl. Austr.* vii. 669. Wall Barley. A coarse tufted or decumbent grass, varying from 6 in. to 2 ft. high. Leaves flat, the sheaths rather loose and glabrous, the lamina usually hairy. Spike dense and cylindrical, 2 to 4 in. long, thickly beset all round with the long erect rough awns. Spikelets 3 to 6 lines long without the awns, the outer empty awnlike glumes all at the base of the short rhachis forming a kind of involucre round the flowering ones, those of the central spikelet though very narrow and rigid, dilated and ciliate in the lower half, and the lowest awn of the lateral spikelets usually very slightly dilated and shortly ciliate, the 2nd subulate and scabrous only. Flowering glume usually glabrous outside, more or less ciliate inside, the ribs of the palea also ciliate. Awns varying from $\frac{1}{2}$ to 1 in. long.—*Reichb. Ic. Fl. Germ.* t. 11; *F. v. M. Fragm.* viii. 126.

Hab.: A widely distributed species established in places towards Wallangarra.

2. ***H. vulgare*** (common), *Linn. Spec. Pl.* 84. Spikelets 2 to 6-rowed, flowering glume with long awns.

Var. hexastichen. Spikelets in 6 rows. The Six-rowed Barley.

Var. distichon. Spikelets in 2 rows. The Malting Barley.

These are the Barleys of cultivation, and are met with as strays from cultivation.

95. BAMBUSA, Schreb.

(From the Indian name *Bambos*.)

Shrubs or trees, usually large and cæspitose, rarely climbing; stem sheaths broad, blade often triangular. Leaves shortly petiolate, not tessellate by nervules, but sometimes by pellucid glands, sheaths variously auricled. Inflorescence generally a large leafless panicle bearing heads on spiciform branches, or of leafy panicles, or paniculate spike. Spikelets of 1 or many flowers; lower glumes 1 to 4, empty or gemiferous; flowering glumes ovate-lanceolate, uppermost imperfect; palea 2-keeled. Lodicules 2 to 3, membranous, ciliate, rarely wanting. Stamens 6. Ovary oblong or obovate, tip hairy; style long or short, stigmas 2 to 3. Grain oblong or linear-oblong, furrowed on one side; pericarp thin, adherent.—*Hook. Fl. Brit. Ind.* vii. 386.

1. **B. Moreheadiana** (after the Hon. B. D. Morehead, M.L.C.), *Bail. Rep. Bot. Bell. Ker. Exped.* 1889 and *Syn. Qt. Fl. 3rd Suppl.* 87. The Queensland Climbing Bamboo. A rampant climbing plant scaling the tops of the highest trees of the scrubs, and hanging in festoons from the branches, probably the stems extend over 200ft. in length. The largest diameter of stem measured 2in., the hollow or pipe about one-third of its diameter; length of internode, under 1ft.; the whole plant more or less clothed with dark-coloured bristle-like hairs or scales; stem-buds hemispheric $\frac{3}{4}$ in. diameter; stem-leaves with a lance-like lamina 2 or 3in. long; the leafy shoots which are numerous from the upper nodes, are much flattened, and the lamina of leaf measures from 6 to 10in. long and from 1 to 2in. broad, glabrous, with 6 or 7 parallel nerves on each side of the midrib, points filiform, the margins entire except for a few distant minute teeth.

Hab.: Harvey's Creek, Russell River.

Baron von Mueller, in the *Aust. Journ. of Pharm.* 1886, drew attention to a Queensland species of *Bambusa*, but the specimens and the collector's notes he thought insufficient to name the species; and even now, not having seen the inflorescence, by some it may be deemed too early to have given to it specific distinction, but the uncertainty of the flowering of plants of the genus, and that the stems are being put to many useful purposes, is, I consider, sufficient excuse; and when the flowers and fruit are obtained the species can then be placed in the tribe and genus to which it may prove to belong.

ORDER CLIV. LYCOPODIACEÆ.

Stem or rhizome bearing true leaves, either linear, or small and 1-nerved, or reduced to minute scales. Spore-cases solitary or few together, sessile in the axils of the leaves or of the bracts of a terminal spike, either all similar or of two kinds, larger ones *macrosporangia* containing a few larger spores or *macrospores*, and smaller *microsporangia*, containing numerous smaller often microscopic *microspores*, the differences now generally admitted to be sexual.

The order is spread over nearly the whole globe.

- | | |
|---|-----------------|
| Leaves linear, on a rhizome often submerged. Spore-cases of 2 kinds, solitary in the axils or half-enclosed in the dilated bases of the leaves | 1. ISOETES. |
| Stems branching, with small leaves usually crowded in 4 rows. Spore-cases solitary within the bracts of terminal spikes or the upper leaves of the stem. | |
| Spore-cases and spores all similar | 2. LYCOPODIUM. |
| Spore-cases and spores of two kinds. Plants usually weaker or smaller than in <i>Lycopodium</i> | 3. SELAGINELLA. |
| Small floating plant with small crowded leaves. Spore-cases of 2 kinds in the axils of some of the stem-leaves | 4. AZOLLA. |
| Stems leafy or with distant scales. Spore-cases 2 or 3 together, united into a 2 or 3-celled capsule or sorus, sessile at the base of bifid bracts or scales. | |
| Stems simple, leafy. Sori usually 2-celled | 5. TMESIPTERIS. |
| Stems dichotomous, with minute distant scales. Sori usually 3-celled | 6. PSILLOTUM. |

1. ISOETES, Linn.

(From two Greek words, *isos*, equal, and *etos*, the year—on account of its leaves remaining throughout the year).

Aquatic plants entirely submerged or rarely terrestrial in swampy or wet sandy places. Leaves linear and thick or subulate, crowded on a short thick rhizome, dilated and concave at the base, the margins of the cavity often more or less folded over the spore-cases. Spore-cases sessile at the base of the leaves, solitary membranous, of two kinds, those of the outer leaves filled with spherical macrospores, marked with a transverse raised line, and above it 8 radiating raised lines, those of the inner leaves filled with minute powdery microspores.

A small genus having nearly the general range of the order except in hot or dry climates.

1. **I. Muelleri** (after Baron von Mueller), *A. Br. in Berl. Monatber.* 1868, 541; in *J. G. Baker's Fern-Allies*, 127. Rhizome 9-lobed. Leaves about 3 in. long, pale green, diaphanous, narrowed to the point, furnished with stomata, but without accessory bast-bundles. Sporangia globose; veil complete. Macrospores with numerous minute unequal tubercles confluent into ridges.

Hab.: In ponds about Rockampton, P. O'Shanassy.

2. LYCOPODIUM, Linn.

(From *lykos*, a wolf, and *pous*, a foot, supposed resemblance of the roots).

Stems leafy, hard, branching, creeping prostrate or erect. Leaves small, entire or minutely serrate, inserted all round the stem, usually in 4 rows. Spore-cases all of one kind, flattened, 1-celled, 2-valved, sessile in the axils of the upper leaves, or of bracts usually smaller or broader than the stem-leaves and forming terminal or lateral spikes. Spores all minute and powdery.

The genus is widely spread over every part of the globe.

Leaves lanceolate, cartilaginous, crowded all round the stem, mostly 3 to 6 lines long.

Stems elongated, ascending. Spikes terminal, usually several. Bracts smaller than the stems-leaves but much longer than the spore-cases 1. *L. varium*.

Stems elongated, pendulous. Spikes terminal, several. Bracts scarcely exceeding the spore-cases 2. *L. phlegmaria*.

Only differing from the preceding in that the leaves are in wing-like rows 3. *L. phlegmarioides*.

The whole plant glaucous 4. *L. Clava*.

Leaves usually narrow, crowded round the stem, under 3 lines long.

Spore-cases in spikes, with small broad bracts.

Spikes pedunculate.

Stems creeping, short or scarcely branched. Spikes single on lateral erect peduncles bearing small leaves 5. *L. Drummondii*.

Spikes sessile, lateral.

Stems branched at the base, elongated and slender. Leaves subulate 6. *L. laterale*.

Spikes sessile, terminal, usually short. Stems often above 2 ft. long.

Branches numerous, spreading or flexuose. Spikes nodding 7. *L. cernuum*.

Stems and branches erect, dense. Spikes erect 8. *L. densum*.

1. **L. varium**, (variable), *R. Br. Prod.* 165; *Benth. Fl. Austr.* vii. 674. A variable species, the smaller plants often compact, usually decumbent or elongated and rooting at the base, with ascending branches of 6 in. to 1 ft. Leaves crowded all round the stem, lanceolate, obtuse, spreading or rarely erect, 3 or 4 lines or sometimes nearly $\frac{1}{2}$ in. long. Spikes terminal, 1 to 4 in. long, solitary or 2 or 3 together, continuous with the leafy branch with bracts sometimes leafy 2 or 3 lines long, in other specimens short broad obtuse, imbricate in 4 rows, and 1 to 2 lines long, almost as in *L. phlegmaria*, or small and acuminate. Spring. Monogr. Lycopod. i. 57, ii. 24; Hook. and Grev. Ic. Filic. t. 112; Hook. f. Fl. Tasm. ii. 155, t. 170; *L. selago*, var. F. Muell. Fragm. v. 111.

Hab.: Queensland tropics.

Also in New Zealand, the Pacific Islands and South Africa.

2. **L. phlegmaria**, (from its supposed medicinal properties in cases of inflammation), *Linn.*; *Spring. Monogr. Lycop.* i. 63, ii. 28; *Benth. Fl. Austr.* vii. 674. Tasseled Club-moss. Epiphyte, the plants often large. Stems elongated, usually pendulous from rocks or trunks of trees. Leaves scattered, crowded, cartilaginous, spreading, mostly lanceolate and 3 to 6 lines long, but occasionally oblong and obtuse. Spikes slender at the ends of the branches,

usually several and often forked, 2 or 3 to even 6 or more in. long. Bracts imbricate in 4 rows, usually broad and scarcely exceeding the spore-cases, but in some specimens with a lanceolate point twice as long.

Hab.: Rockingham Bay, *Dallachy*; Daintree River, *Fitzalan*. A common tropical epiphyte. Widely spread over tropical Africa and Asia.

3. ***L. phlegmarioides***, (like *phlegmaria*), *Gaudich. Freyc. Voy. i. 28*. Epiphyte. Stems pendulous, $1\frac{1}{2}$ to 3 ft. long, dichotomously forked. Leaves ovate, ascending, obtuse or subacute, 3 to 5 lines long, firm in texture, bright-green, rigid, entire; midrib distinct, arranged in 3 or 4 rows. Spikes very slender forked 3 to 6 in. long; bracts dense, broad-ovate, slightly exceeding the sporangia.

This species has the tassel-like inflorescence of *L. phlegmaria*, to which it should probably be placed as a variety, for its only distinction seems to be in the direction taken by the stem leaves, which, instead of being scattered as in *L. phlegmaria*, form 4 even wings to the stem.—*L. tetrapterium*, Bail. in Proc. Roy. Soc. Ql. i.

Hab.: On trees. Johnstone and other tropical rivers.

4. ***L. Claræ*** (after Miss Clara Cowley), *Bail. Bot. Bull. vii. "Goorigen," Barron River, Cowley*. Stems pendulous from rocks or trunks of trees, from $1\frac{1}{2}$ to 3 ft. long, rarely forked, from 1 to $1\frac{1}{2}$ in. diameter including the leaves, which are so dense as to hide the stem. Leaves lanceolate, much narrowed towards the apex, from $\frac{3}{4}$ to over 1 in. long, of a somewhat membranous texture, and of a rich glaucous green, the midrib obscure, margins entire. Sporangia in the axils of unaltered leaves, numerous and large.

Hab.: Upper Freshwater Creek, *Miss Clara Cowley*.

5. ***L. Drummondii*** (after James Drummond), *Spring, Monogr. Lycop. ii. 34; Baker's Mon. 19*. Stems leafy but creeping and rooting like rhizomes, with very short or scarcely any ascending barren branches. Leaves crowded, narrow lanceolate, acuminate, not above 2 lines long, two rows often rather longer and more spreading than the other two. Fertile branches (often called peduncles) erect, 1 to 6 in. high including the spike, with small loosely erect leaves, the spike or fruiting part terminal or sometimes below the end. Bracts small, subulate-acuminate and spreading from a broad base, often but not always minutely serrulate-ciliate.—*Hook. f. Fl. Tasm. ii. 170; F. v. M. Fragm. v. iii.; L. carolinianum*, Linn. Benth. *Fl. Austr. vii. 675*.

Hab.: Islands of Moreton Bay.

The species extends over North and South America, tropical and southern Africa, Ceylon and New Zealand.

6. ***L. laterale*** (lateral), *R. Br. Prod. 165; Benth. Fl. Austr. vii. 675*. Stems leafy from the base, prostrate decumbent or ascending, slightly branched, from a few inches to 2 feet long. Leaves crowded all round, lanceolate-subulate, 2 to 3 lines long. Spikes few, lateral and sessile, mostly about $\frac{1}{2}$ in. long. Bracts small, from a very broad base shortly acuminate, usually brown-coloured.—*Spring, Monogr. Lycop. i. 82, ii. 88; Labill. Sert. Austr. Caled. t. 15; Sieb. Syn. Filic. n. 84*.

Hab.: Rockingham Bay, *Dallachy*; Moreton Island, *F. v. Mueller*. Also in New Caledonia and New Zealand.

7. ***L. cernuum*** (drooping), *Linn.; Spring, Monogr. Lycop. i. 79, ii. 37; Benth. Fl. Austr. vii. 676*. Stems hard, rising to 2 ft. or when very luxuriant to 5 or 6 ft. in height, with numerous spreading flexuose repeatedly-forked branches. Leaves spreading all round the stem, fine, subulate, incurved, 1 to 2 lines long. Spikes sessile above the last leaves, nodding, 2 to 3 lines long. Bracts ovate-lanceolate, ciliate, imbricate in 3 rows, longer than the spore-cases.

Hab.: Common all along the coast.

Common throughout the tropics in the New as well as the Old World.

8. **L. densum** (dense), *Labill. Pl. Nov. Holl.* ii. 104 t. 251; *Benth. Fl. Austr.* vii. 676. Stems from a short creeping base, erect, rigid, usually 1 to 1½ but sometimes 2 to 4 ft. high, very densely branched in the upper part. Leaves crowded all round, those of the main stem lanceolate with scarious tips and often 2 lines long, those of the branches imbricate and scarcely 1 line long. Spikes numerous, terminal, erect and sessile, from under ½ in. to 1 in. long. Bracts ovate-lanceolate, with spreading tips often scarious on the margins.—R. Br. Prod. 165; Spring, *Monogr. Lycop.* i. 86, ii. 40; Hook. f. *Fl. Tasm.* ii. 156; F. v. M. v. 111; Sieb. *Syn. Filic.* n. 82.

Hab.: Inland southern localities.

Also in New Zealand and Norfolk Island.

8. SELAGINELLA, Spring.

(Diminutive of *Selago*, the old name for *Lycopodium*.)

Stems leafy, usually much branched, more slender or smaller than in *Lycopodium*. Leaves small, entire or minutely serrate, inserted all round the stem but in four rows. Spore-cases of two kinds, small ones filled with minute powdery spores called *microspores*, and larger containing 1 to 6 larger spores called *macrospores*, all opening in 2 to 4 valves and sessile in the axils of bracts in terminal spikes.

The genus has the same wide range as *Lycopodium*. The generic character, the presence of two kinds of spores, is probably constant, but requires a close observation to verify it.

Small erect plants. Stems-leaves all similar. Spikes slender, the bracts imbricate in 4 rows.

- | | |
|---|------------------------------|
| Stems from a branching base, simple, about 1 in. long | 1. <i>S. Preissiana</i> . |
| Stems branching upwards, 2 to 6 in. or sometimes more | 2. <i>S. uliginosa</i> . |
| Stem-leaves in two outer rows distichous and spreading, 2 inner rows closely appressed. Spikes slender, the bracts imbricate in 4 rows. | |
| Stems bare at the base, ascending or erect, very much branched upwards to a length and breadth of 6 to 10 in. (in outline) | 3. <i>S. flabellatum</i> . |
| Stems diffuse or creeping and much branched. | |
| Plant wiry. Spikes about 8 lines long | 4. <i>S. australiensis</i> . |
| Plant a delicate creeper. Spikes 3 to 6 lines long | 5. <i>S. brisbanensis</i> . |
| Plant shortly creeping. Stems dense. Spikes 1 to 3 in. long | 6. <i>S. Bakeriana</i> . |
| Plant usually smaller than the last. Spike oblong, the bracts spreading, nearly resembling the stem-leaves | 7. <i>S. proutiflora</i> . |
| Stems simple, 1 in. high. Spikes very short | 8. <i>S. pumilio</i> . |

1. **S. Preissiana** (after L. Preiss), *Spring, Monogr. Lycop.* ii. 61; *Benth. Fl. Austr.* vii. 677. An erect slender annual of 1 to 2 in., divided at the base into simple or once forked branches leafy throughout. Leaves all similar, spreading, very narrow, acuminate, ½ to ¾ line long. Spikes occupying usually the greater part of the plant. Bracts the length of the stem-leaves, acute or acuminate, imbricate in 4 rows.—F. v. M. *Fragm.* v. 112; *Lycopodium gracillimum*, Kunze in *Pl. Preiss.* ii. 109.

Hab.: Stanthorpe.

2. **S. uliginosa** (of swamps), *Spring, Monogr. Lycop.* ii. 60; *Benth. Fl. Austr.* vii. 678. Stems from a creeping base erect or ascending, slender but rigid, branching and leafy throughout, usually 2 to 6 in. long but occasionally much drawn up. Leaves all similar or nearly so, ovate-lanceolate, acute, keeled, spreading or at length reflexed, sometimes oblique but not vertical. Spikes terminal, slender, from 3 or 4 lines to 1 in. long. Bracts smaller, narrower, and more acute than the stem-leaves, imbricate in 4 rows, the points appressed or slightly spreading.—Hook. f. *Fl. Tasm.* ii. 158; F. v. M. *Fragm.* v. 112; *Lycopodium uliginosum*, Labill. *Pl. Nov. Holl.* ii. 104, t. 251; R. Br. Prod. 165; Sieb. *Syn. Filic.* n. 83.

Hab.: Stradbroke Island, *W. Hill*.

3. ***S. flabellata*** (fan-like), *Spring, Monogr. Lycop.* ii. 174; *Benth. Fl. Austr.* vii. 678. Rhizome creeping and rooting to a great extent, emitting erect leafy stems, simple for 2 to 4 in., then expanding into a broadly ovate form, 6 to 10 in. long and sometimes nearly as wide, densely branched. Leaves in 4 rows, the 2 outer rows distichously spreading, nearly vertical, falcate, 1 to 1½ line long, usually dark green on the upper side, pale and shining underneath in the dried state, inner rows not half so long, semicordate, fine pointed, converging over the rhachis. Spikes 8 to 9 lines long, slender. Bracts keeled, fine-pointed, imbricate in 4 rows.—*Lycopodium flabellatum*, Linn.

Hab.: Rockingham Bay, *Dallachy*; Daintree River, *Fitzalan*; on the margins of most of the Northern creeks.

Also in the Malayan Archipelago to South China and in tropical America. The species probably includes *S. argentea*, *Spring*, and some others.

4. ***S. australiensis*** (of Australia), *Baker Journ. Bot.* 1868. The stems of this plant extend some distance, are strong, wiry, and furrowed; the leaves distant, spreading, and rigid on the main stem, but narrower and closer together on the ascending branches, all deep-green. Spikes terminal, about 8 lines long.

Hab.: Logan and Nerang Creek scrubs.

5. ***S. brisbanensis*** (of Brisbane), *Bail. 1st Suppl. Syn. Ql. Fl.* 62. This is an extremely delicate plant, its thread-like stems rambling to some distance; foliage not very dense, the whole plant at times having a somewhat bronze appearance. Leaves rather distant and of delicate texture. Spikes 8 to 6 lines long.

Hab.: Brisbane River scrubs.

The spikes of this and *S. australiensis* are never so numerous and prominent as in *S. Bakeriana*, *Bail.*

6. ***S. Bakeriana*** (after J. G. Baker), *Bail. 1st Suppl. Syn. Ql. Fl.* 62. Stems creeping and rooting, but sending up from the upper edge erect, dichotomously branched, short branches, the extremity of each branchlet terminated by a long, narrow, erect spike. Larger leaves in 2 rows, distichously spreading, lanceolate, acute or obtuse, about 1 line long, the inner ones somewhat falcate, the lower part appressed, the upper part spreading, all sharply keeled, margins serrate. Spikes terminal, very numerous, 1 to 8 in. long and scarcely 1 line in diameter. Bracts acuminate, keeled, and closely imbricate in 4 rows, the tips scarcely spreading.—*S. leptostachya*, *Bail., Proc. Roy. Soc. Ql.* i.

Hab.: Johnstone River and other tropical localities.

This is one of the most beautiful of the genus. It forms very dense masses of dark-green foliage, almost every growth terminating in a long slender spike of fructification.

7. ***S. proniflora*** (flowers prone), *Baker in Journ. Bot.* 1885, 156. Stems creeping, pinnately branched, leafy throughout, rarely 6 in. and often under 1 in. long. Larger leaves in 2 rows, distichously spreading, scarcely 1 line long, ovate; 2 inner rows appressed, rather smaller. Spikes terminal, oblong, rarely above 6 lines long, 2 lines broad in the larger specimens, the spreading bracts very similar to the larger stem-leaves.—*S. Belangeri*, *Spring, Monogr. Lycop.* ii. 242; *Benth. Fl. Austr.* vii. 679; *Lycopodium proniflorum*, *Lam.*; *L. Belangeri*, *Bory in Belang, Voy. Bot.* 12, t. 1, f. 2.

Hab.: Etheridge River, *Gulliver*; Rockingham Bay, *Dallachy*; York Peninsula, *N. Taylor*.

8. ***S. pumillo*** (dwarf), *Spring, Mon.* ii. 241; *Baker, Fern Allies*, 114. Stems very slender, erect, nearly simple, under 1 in. long, the root-fibres confined to the base. Leaves of the lower plane spaced, ovate, acute, denticulate, ½ line long, membranous, nearly equal-sided; of the upper plane one-third as long, ovate,

acute. Spikes very short, resupinate. Bracts dimorphous, those of the upper plane ovate, acute, erecto-patent; of the lower plane ovate-cuspidate, ascending.—*Lycopodium pumilio*, R. Br.

Hab.: Endeavour River, Banks and Solander.

4. AZOLLA, Linn.

(From *azo*, to dry, and *ollo*, to kill; a dry condition causes the plant to perish.)

Small floating plants, with branching and rooting leafy stems. Leaves small, imbricate, unequally 2-lobed. Spore-cases in pairs, sessile in the axils of the leaves on the main branches, one a globular membranous sac enclosing a cluster of small globular pedicellate spores (or sporangia), the other smaller, ovoid, containing a single macrospore surrounded at the base by 2, 4 or more corpuscles, called by some antheroids, by others abortive spores.

A genus of few species, dispersed over the tropical, the Northern subtropical and Southern cooler regions of the globe. Of the two Australian species one is also Asiatic and African, the other extends only to New Zealand,

Branches of the stem linear and regularly pinnate	1. <i>A. pinnata</i> .
Branches of the stem with the leaves shortly obovate	2. <i>A. rubra</i> .

1. *A. pinnata* (pinnate), R. Br. in *Flind. Voy.* ii. 611, t. 1C, *Prod.* 167; *Benth. Fl. Austr.* vii. 679. Stems once or twice pinnate, broadly ovate in outline, with linear leafy branches, each plant under 1 in. long but generally collected in large masses on the surface of the water, emitting numerous rootlets, at first entire and sometimes dilated and flat, the older ones elegantly feathery. Leaves ovate, obtuse, concave, regularly but loosely imbricate, the upper lobe of each leaf about $\frac{1}{2}$ line long, the lower lobe smaller. Larger spore-cases when full-grown globular, reddish, nearly 1 line diameter, the smaller ones oblong, about $\frac{1}{2}$ line long, with usually 4 corpuscles at the base of the macrospore.—Griff. in *Calcutta Journ. Nat. Hist.* v. 257, t. 15 to 17; Metten. in *Linnaea*, xx. 278, t. 8.

Hab.: Southern still waters. Dispersed over tropical Asia and Africa.

2. *A. rubra* (red), R. Br. *Prod.* 167; *Benth. Fl. Austr.* vii. 680. Individual plants smaller more compact and broader than in *A. pinnata*, the branches short, with fewer closely imbricate but spreading leaves, the roots all simple. Larger spore-cases globular, about $\frac{1}{2}$ line diameter, the smaller oblong ones scarcely $\frac{1}{2}$ line, the structure otherwise the same as in *A. pinnata*.—Hook. f. *Fl. Tasm.* ii. 158.

Hab.: Common, still waters. Also in New Zealand.

5. TMESIPTERIS, Bernh.

(Named from the position of the sori, in notch of bract.)

Stems simple, leafy. Leaves vertical, sessile and decurrent, entire, intermixed with leafy bracts bipartite on a short petiole. Spore-cases usually two together, united into a capsule-like sorus, sessile on the petiole of the bracts, transversely oblong, flattened, 2-celled and didymous or 2-lobed, opening loculicidally in 2 valves. Spores minute, uniform.

The genus is limited to a single species found also in New Zealand and the Pacific Islands.

1. *T. tannensis* (of Tanna), Bernh. in *Schrad. Journ.* 1800, ii. 181, t. 2, f. 5; *Benth. Fl. Austr.* vii. 680. Stems from a creeping slender rootstock ascending or pendulous, 6 in. to 1 ft. long. Leaves obliquely oblong or narrow lanceolate, usually about $\frac{1}{2}$ in. long but sometimes nearly lin., truncate obtuse or acute at the end, the lower margin shortly decurrent, the single central nerve often produced at the end into a fine point. Bracts rather shorter than the leaves and occasionally replacing them in the upper part of the stem, deeply divided into 2

segments like the leaves but smaller and more acute. Capsule-like sori about 2 lines broad and 1 line long, much compressed, parallel to the petiole.—Labill. Pl. Nov. Holl. ii. 105, t. 252; F. v. M. Fragm. v. 112; *Lycopodium tannense*, Spreng. in Schrad. Journ. 1799, ii. 267; *Psilotum truncatum*, R. Br. Prod. 164; *Psilotum Forsteri*, Endl. Iconogr. t. 85; *Tmesipteris truncata*, Desv. in Ann. Soc. Linn. Par. vi. 192; Hook. Gen. Filic. t. 86; *T. Forsteri*, Endl. Prod. Fl. Norf. 6; Spring, Monogr. Lycop. 255; Hook. f. Fl. Tasm. ii. 155; *T. Billardieri*, Endl. l. c. 6; Spring, l.c. 266.

Hab.: Bellenden Ker Range and Mount Lindsay, *W. Hill*; Rockingham Bay, *Dallachy*; and also on mountains generally.

6. PSILOTUM, Swartz.

(Referring to the plants being leafless.)

Stems dichotomous, with distant notches bearing minute scale-like leaves, sometimes scarcely prominent, occasionally replaced by equally minute bifid bracts. Spore-cases usually 3 together, united in a capsule-like sorus, sessile in the axil of or attached to the bracts, nearly globular, 3-lobed, 3-celled, opening loculicidally in 3-valves. Spores minute, uniform.

A small tropical and subtropical genus common to the New and the Old World. Both the Australian species have a wide range in America and Asia, but perhaps one only in Africa.

Branches, at least the fertile ones angular 1. *P. triquetrum*.

Branches all flat 2. *P. complanatum*.

1. ***P. triquetrum*** (3-sided), Swartz.; Spring, Monogr. Lycopod. ii. 269; Benth. Fl. Austr. vii. 681. Rhizome short, intricately branched. Stems erect or pendulous when on trees, from 3 or 4 in. to above 1 ft. long, repeatedly dichotomous in the upper part, the fertile branches 3-angled, the barren ones usually flattened. Scale-like leaves minute and subulate, the bracts subtending the spore-cases equally small and distant but forked. Capsule-like sori globular, about 1 line diameter, attached to the bract below the fork.—R. Br. Prod. 164; Hook. Gen. Filic. t. 87, Filic. Exot. t. 63.

Hab.: Rockingham Bay, *Dallachy*; Rockhampton and neighbourhood, *Bowman*, *O'Shanesy*; Moreton Bay and other southern localities, *W. Hill*, *F. v. Mueller* and others.

In most tropical or subtropical moist regions in the New and the Old World, more rare in Africa.

2. ***P. complanatum*** (flattened), Swartz.; Spring, Monogr. Lycop. ii. 271; Benth. Fl. Austr. vii. 682. Stems dichotomous as in *P. triquetrum*, but usually longer and looser and the fruiting branches 3-angled, the whole stem flat, varying from 1 to 2 lines broad, rigid or flaccid, the margins alternately notched. Leaves and bracts very minute or almost obsolete. Capsule-like sori smaller than in *P. triquetrum*.—*P. flaccidum*, Spring, l.c.

Hab.: Rockingham Bay, *Dallachy*; Bowen, *Woolle*; Cairns and Johnston River. Also in tropical Asia and America, the Mascarene and Pacific Islands.

ORDER CLV. MARSILEACEÆ.

No true leaves. Fronds as in Filices proceeding from the rhizome and rolled inwards (circinate) at the top when young; barren ones either reduced to a linear stipes or bearing a leaf-like lamina divided into 4 digitate leaflets; fertile fronds on a shorter stipes or nearly sessile, the lamina recurved with the margins united, forming an ovoid or globular utricle usually called an *involucre*. Spore-cases of some kinds as in some Lycopodiaceæ, but arranged as in Filices in sori inside the involucre (*i.e.*, on the under surface of the recurved frond), each sorus enclosed in a membranous indusium, apparently dividing the involucre into as many cells.

The Order is limited in Queensland to one genus.

1. MARSILEA, Linn.

(After Count L. F. Marsigli.)

Rhizome creeping and rooting at the nodes. Barren fronds with a long petiole or stipes, the lamina divided into 4 digitate leaflets, with numerous forked veins radiating from their base. Involucres sessile or stipitate, their stipes often but not always combined at the base with those of the barren fronds as in *Ophioglossæ*. Sori linear, on transverse veins proceeding from the upper side or midrib of the involucre, the *indusia* often more or less combined, dividing the involucre into 2 series of transverse cells. Each sorus consisting of few macrosporangia, each one surrounded by several microsporangia.

The genus has a wide range in the northern hemisphere and one of the Australian species does not appear to be distinct from the common northern one. The others are probably endemic.

- Whole plant glabrous. Leaflets obovate. Involucres on stipes not exceeding $\frac{1}{2}$ in. and often very short 1. *M. Brownii*.
 Leaflets narrow-oblong. Involucres hirsute, sessile or nearly so 2. *M. angustifolia*.
 Leaflets obovate usually hirsute. Involucres hirsute, sessile or nearly so 3. *M. hirsuta*.
 Leaflets obovate, often crenate; silky-villous underneath. Involucres on stipes of 1 to nearly 2 in. 4. *M. Drummondii*.

1. ***M. Brownii*** (after Dr. Robert Brown), *A. Br. in Berl. Monat.* 1863, 418; *Baker's Fern Allies*. Whole plant quite glabrous. Leaflets on a long stipes, deltoid, $\frac{1}{2}$ to $1\frac{1}{2}$ in. long and broad; outer edge rounded, quite entire. Involucres obliquely ovoid or almost globular, 2 to 3 lines long, mostly in clusters of 2, 8 or rarely 4, the stipes or peduncles not exceeding $\frac{1}{2}$ in. and often shorter, more or less united at the base and very shortly so with the base of the stipes of the barren frond. Sori about 15.—*M. quadrifolia*, Linn., Benth. *Fl. Austr.* vii. 688.

Hab.: Still waters of southern localities.

2. ***M. angustifolia*** (narrow-leaved), *R. Br. Prod.* 167; *Benth. Fl. Austr.* vii. 688. Leaflets narrow-oblong, very obtuse truncate or slightly toothed at the end, the stipes slender, filiform, 2 to 8 in. long in Brown's specimens, glabrous or nearly so. Involucres hirsute and nearly sessile as in *M. hirsuta*, but in the few specimens seen solitary at the nodes. Sori about 20.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*; Aramac, *C. W. de Burgh Birch*.

3. ***M. hirsuta*** (hairy), *R. Br. Prod.* 167; *Benth. Fl. Austr.* vii. 688. Young ends of the rhizome densely rusty-villous. Leaflets obovate or broadly cuneate, sparingly or densely hirsute underneath, the stipes usually long and slender. Involucres small, usually clustered, sessile at the base of the barren fronds or on a stipes shorter than the involucre. Sori about 15.—*A. Br. in Berl. Monatsber.* 1870, 782.

Hab.: Islands of the Gulf of Carpentaria, *R. Brown*; Broadsound, *R. Brown*; Brisbane River, Moreton Bay, *F. v. Mueller*.

Baker in *Fern Allies* describes this as a wide trailing terrestrial form, with leaves and fruits in dense tufts at the distant nodes, and small silky leaflets of firm texture.

4. ***M. Drummondii*** (after James Drummond), *A. Br. in Linnaea*, xxv. 721. *Baker's Fern Allies*. Nardoo. Large sub-terrestrial or aquatic. Stipes often 6 in. long or more; leaflets deltoid, usually silky, 6 to 9 lines long; outer edge rounded, entire or more frequently crenate. Peduncles sometimes exceeding 2 in., rigid, erect, adnate to the upper part of the base of the involucre. Involucres oblique-oblong, not bordered, with the dorsal suture nearly straight, 8 to 4 lines long, obliquely ascending, cuspidate, with a pair of smaller teeth at the upper

corner of the base. Sori 15 to 20.—Baker, l.c.; *M. Macropus*, Hook. Ic. Pl. t. 909, Gard. Ferns, t. 63.

Hab.: Inland.

Var. *Muelleri*. Involucre more regularly oblong, the dorsal suture more rounded—Baker l.c.

Var. *elata*. Involucre erect. Peduncle, 2½ to 3 in. long.

All collectors state that the spore cases with spores are collected by the aborigines and after preparation used by them for food.

ORDER CLVI. FILICES.

No true leaves. Plants consisting of a rhizome or rooting or twining stem or simple trunk, emitting either alternate or a terminal tuft of more or less leaflike fronds. These consist of a stalk or stipes, frequently bearing narrow brown glossy scales especially at the base and on the rhizome, and a simple or variously divided or compound lamina, usually more expanded and leaflike when barren than when fertile, the frond when young rolled inwards or *circinate* at the top (except in *Ophioglossæ*). Spore-cases usually small, collected (rarely united) in clusters or patches called *sori* (rarely solitary) on the under surface or margins of the fertile fronds, which are either nearly similar to the barren ones or very narrow resembling simple or branched spikes. Sori either naked, or covered when young with a membrane called *indusium* (or sometimes involucre), variously opening with the growth of the spore-cases, but usually remaining attached to the frond on one or both sides or rarely in the centre.

This beautiful Order is abundant in all moist climates hot or cold, less so in dry and arid countries. The majority of the genera and a considerable number of species are as widely diffused as Grasses and Cyperaceæ.

TRIBE I. Ophioglossæ.—Fronds not circinate, the barren frond or portion of frond leaflike, the fertile portion spikelike, simple or branched, the stipes of both frequently combined at the base. Spore-cases globular, 2-valved, without any ring, sessile in 2 rows or in small clusters on the spike or its branches.

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| Barren and fertile fronds undivided or once forked. Spore-cases sessile slightly connate in 2 rows on the rhachis of the spike | 1. OPHIOGLOSSUM. |
| Barren and fertile fronds branched. Spore-cases sessile in 2 rows on the branches of the panicle | 2. BOTRYCHUM. |
| Barren fronds 3-partite, with divided segments. Fertile fronds spike-like. Spore-cases in small dense clusters all round the rhachis | 3. HELMINTHOST. CHYS. |

TRIBE II. Marattiesæ.—Spore-cases without any perfect ring, opening in 2 valves or in a longitudinal slit, sessile or united, in 2 rows, in sori forming marginal lobes to the segments or placed on their under surface.

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| Climbing ferns. Sori forming small lobes bordering the pinnules of the divided fronds | 4. LYGODIUM. |
| Erect simple or dichotomous ferns, without expanded laminae. Sori forming small lobes pinnately contiguous and secund at the ends of the branches | 5. SCHIZEA. |
| Fronds large, bipinnate. Sori oblong, placed side by side in a continuous row on the under side of the segments near the margin. Spore-cases distinct, sessile in 2 rows | 6. ANGIOPTERIS. |
| Spore-cases in 2 rows, but consolidated into entire boat-shaped sori | 7. MARATTIA. |

TRIBE III. Osmundesæ.—Spore-cases globular or nearly so without any or with an imperfect or transverse ring, opening in 2 valves or irregularly, few, sometimes solitary, rarely numerous and clustered in sori, on the under surface of the segments or pinnules.

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| Fronds compound, barren ones with flat segments, fertile with linear segments. Spore-cases large, scattered along the longitudinal veins and enclosed in the revolute margins | 8. CERATOPTERIS. |
| Fronds simply pinnate, with small pinnules. Sori of 2 to 4 spore-cases terminating transverse veins proceeding from the midrib | 9. PLATYZOMA. |
| Fronds dichotomous. Pinnules pinnately distichous. Sori of few spore-cases, attached to one branch of forked veinlets proceeding from the midrib | 10. GLEICHENIA. |
| Fronds bipinnate. Sori of few or numerous spore-cases at the base of or covering the veins proceeding from the midrib | 11. TODEA. |

TRIBE IV. Hymenophylles.—*Spore-cases depressed, with a transverse ring, sessile or nearly so on a columnar receptacle within a cup-shaped or 2-lobed indusium, embedded in or protruding from the margin of the frond. Fronds of a thin membranous half-pellucid texture.*

- Indusium cup-shaped or tubular, with an entire or shortly 2-lobed margin 12. **TRICHOMANES.**
 Receptacle often exserted
 Indusium divided to below the middle into 2 valves. Receptacle usually included 13. **HYMENOPHYLLUM.**

TRIBE V. Cyatheae.—*Trees. Fronds large, compound. Spore-cases small, with a more or less oblique ring, sessile on a slightly raised receptacle, in globular sori on the under surface of the fronds.*

- Indusium at first globular enclosing the sorus, at length cup-shaped under it 14. **CYATHEA.**
 No indusium 15. **ALSOPHILA.**

TRIBE VI. Polypodiæ.—*Habit various. Spore-cases small, with a longitudinal or scarcely oblique ring, numerous and stipitate in sori or patches on the under-side or rarely the margins of the frond.*

A. Sori covered at least when young with an indusium.

- Sori globular or slightly oblong. Indusium cup-shaped or globular and 2-valved.
 Sori close to the margin. Indusium adnate on the upper side, opening in 2 valves or leaving a complete ring 16. **DICKSONIA.**
 Sori close to or near the margin. Indusium adnate at the base only or along the sides forming with the frond a complete cup 17. **DAVALLIA.**
 Sori linear, marginal. Indusium linear, opening from the margin inwards.
 Frond simple, linear. Indusium of the texture of the frond, the sorus apparently embedded in a double margin 18. **VITTARIA.**
 Frond pinnate or bipinnate. Indusium membranous 19. **LINDSÆA.**
 Sori marginal. Indusium continuous with the margin and opening from the under edge outwards.
 Fronds pinnate or compound. Veins of the pinnules forked or dichotomous, radiating from the petiole 20. **ADIANTUM.**
 Fronds compound. Pinnules penninerved. Sori short. Indusium a small scale recurved over them 21. **HYPOLEPIS.**
 Fronds compound, with small lobed segments. Sori short or globular. Indusium the slightly altered margins of the lobes curved over them 22. **CHEILANTHES.**
 Fronds various. Sori and indusia linear, usually long and continuous 23. **PTERIS.**
 Sori in a continuous line along the midrib.
 Sori on both sides of the midrib, the indusium opening from the midrib outwards.
 Sori at length covering the under surface of the fertile fronds 24. **LOMARIA.**
 Sori at length confluent over the midrib but distant from the margin 25. **BLECHNUM.**
 Sori in a single line along the midrib, in a groove of which the edges form the indusium. Frond small, single 26. **MONOGRAMME.**
 Sori and indusia oblong or shortly linear, parallel to the midrib, on veinlets connecting the forked veins 27. **DOODIA.**
 Sori and indusia oblong or linear, on veins diverging from the midrib 28. **ASPLENIUM.**
 Sori orbicular, usually small, as in *Polypodium*, but with an indusium. Indusium attached within the sorus, peltate or orbicular-reniform 29. **ASPIDIUM.**

B. No indusium.

- Sori orbicular, usually small, variously arranged on the under surface 30. **POLYPODIUM.**
 Sori marginal as in *Cheilanthes* but the margin unaltered in consistence though often curved over the young sorus 31. **NOTHOLÆNA.**
 Sori linear or oblong, on veins diverging from the midrib, sometimes crowded in an intramarginal line 32. **GRAMMATIS.**
 Sori oblong or linear or sometimes orbicular and geminate, arising from the transverse connivent veinlets 33. **MENISCIUM.**
 Sori long, linear, on the longitudinal anastomosing veins of a simple frond 34. **ANTROPHYUM.**
 Sori confluent, at length completely covering the under surface of the fertile fronds or pinnules 35. **ACROSTICHUM.**
 Spore-cases innumerable in large patches at the ends of the lobes or at the first sinus of the fertile fronds 36. **PLATYCERIUM.**

1. OPHIOGLOSSUM, Linn.

(The name literally means Adder's-tongue, the English name for plants of this genus.)

Barren frond leaflike, entire or forked at the end, reticulately veined. Fertile lamina or spike simple, pedunculate. Spore-cases sessile and more or less combined back to back in 2 rows along the rhachis, opening in a fissure transverse as to the spike, longitudinal as to the spore-case.

A small genus generally spread over the tropical and temperate regions of the globe. Of the two Australian species one has the wide distribution of the genus, the other is tropical Asiatic.

Barren frond ovate-lanceolate or linear, resembling a leaf on the peduncle of the spike

1. *O. vulgatum*.

Barren frond ribbon-like from the base, the spike appearing pedunculate on the lamina

2. *O. pendulum*.

1. *O. vulgatum* (common), Linn.; Hook. and Bak. Syn. Filic. 445; Benth. Fl. Austr. vii. 688. Rhizome small, knotty. Combined frond solitary, from a few inches to near 1 ft. high, the barren leaflike lamina sessile at or below the middle of the stipes, varying from broadly ovate or oblong-lanceolate and 1 to 2 in. long in what may be termed the normal form, to ovate, rotundate, and $\frac{1}{2}$ to $\frac{3}{4}$ in. long, or narrow-lanceolate or linear and 1 to 1 $\frac{1}{2}$ in. long, with every intermediate form and size, copiously reticulate when broad, the veins more longitudinal and slightly anastomosing when the lamina is narrow. Spike varying in length with the size of the plant, with very few to more than a dozen spore-cases in each row.—Hook. Fl. Tasm. ii. 153, t. 169; F. v. M. Fragm. v. 112; *O. gramineum*, Willd. and *O. costatum*, R. Br. Prod. 163.—Bail. Litho. Ferns Ql. i.

Hab.: Brisbane River, Moreton Bay, F. v. Mueller and others; Rockhampton and neighbouring districts, Bowman, Thozet, O'Shanesy.

Var. *gramineum*, Bail. Bot. Bull. 5. Rhizome tuberous. Fronds from 1 to 2 in. high; the sterile portion narrow-lanceolate, $\frac{1}{2}$ to $\frac{3}{4}$ in. long; fertile spike $\frac{1}{2}$ to $\frac{3}{4}$ in. long.—Bail. Litho. Ferns, Ql. i. B.

Hab.: Frequently met with on stony ridges in Southern localities.

Var. *minutum*, Bail. Bot. Bull. 5. Rhizome tuberous. Fronds 1 to 3 in. high, the sterile portion petiolate, lamina roundish or almost rhomboidal, seldom attaining a diameter of 3 lines; fertile spike narrow, sharply pointed, about $\frac{1}{2}$ in. long.—Bail. Litho. Ferns Ql. i. A.

Hab.: On grassy land about the Herbert River.

The species is found in most warm and temperate climates, and everywhere varies so much in the size and shape of the leaflike lamina that it has been divided into a number of species, which the most acute observers in various countries have again united. The Queensland forms, however, may most conveniently be given as above.

2. *O. pendulum* (pendulous), Linn.; Hook. and Bak. Syn. Fil. 446; Benth. Fl. Austr. vii. 689. Ribbon Fern. Barren and fertile frond pendulous from the masses of *Platyserium* on trees, often many feet long, ribbon-like, entire or rarely forked at the end, leaflike throughout or tapering at the base into a very short stipes. Spike 1 to 6 in. long, on a short peduncle arising from the central line of the frond far from or sometimes near the base. Spore-cases in 2 opposite rows as in *O. vulgatum*, buried when young in the continuous margin, at length occupying nearly the whole breadth of the spike, which like the sterile portion is sometimes forked—Sieb. Fl. Mixt. n. 278; Hook. and Grev. Ic. Filic. t. 19; Hook. Gard. Ferns, t. 93; Bedd. Ferns S. Ind. t. 269; Bail. Litho. Ferns Ql. 2.

Hab.: Coastal scrubs south and north.

Also in tropical Asia, extending on the one hand to the Mascarene, on the other to the Pacific Islands.

2. BOTRYCHIUM, Swartz.

(From the Greek, the fructification being supposed to represent a bunch of grapes.)

Barren fronds pinnate or compound. Fertile fronds with branched spikes, forming a pedunculate panicle. Spore-cases sessile in 2 rows along the branches,

marginal but turned inwards, opening in a fissure, transverse as to the rhachis, longitudinal as to the spore-case.

A genus of few species, chiefly extratropical, dispersed over the New and the Old World on the northern and southern hemispheres.

1. ***B. ternatum*** (8-parted), *Swartz.; Hook. and Bak. Syn. Filic.* 448; *Benth. Fl. Austr.* vii. 690. Grape Fern or Moonwort. Stipites of the barren and fertile fronds free below their division and sometimes from the base. Barren laminae 2 to 5 in. long and at least as broad, tripartite with pinnate divisions. Pinnæ ovate-lanceolate in outline, deeply pinnatifid or again pinnate, the segments denticulate. Veins diverging, almost concealed in the thick texture of the frond. Fertile panicle much branched, 1 to 3 in. long and often nearly as broad at the base.—*F. v. M. Fragm.* v. 118; *Osmunda ternata*, Thunb. *Fl. Jap.* 329, t. 32; *Botrychium australe*, R. Br. *Prod.* 164; *B. virginianum*, Hook. f. *Fl. Tasm.* ii. 154, t. 169, not of Swartz.; *Bail. Litho. Ferns* Ql. 8.

Hab.: Moreton Bay and Taylors Range, Rockhampton, and further north.

Also in extratropical North America and Asia and in New Zealand.

3. HELMINTHOSTACHYS, Kaulf.

(The fructification supposed to resemble a spike of worms.)

Barren portion of frond leaflike, divided. Fertile portion of frond a pedunculate spikelike panicle. Spore-cases globular but free, in dense clusters all round the rhachis, opening irregularly in an external slit.

The genus is limited to the single Australian species, which extends over East India, the Malayan Archipelago and New Caledonia.

1. ***H. zeylanica*** (of Ceylon), *Hook. Gen. Filic.* t. 47, 2nd Cent. *Ferns*, t. 94, *Gard. Ferns*, t. 28; *Benth. Fl. Austr.* vii. 690. Rhizome thick, creeping, with fleshy fibres. Fronds united in a stipes often 1 ft. or more high, the fertile leaflike lamina nearly sessile upon it, usually 3-partite, each division deeply pinnatifid. Segments lanceolate, 3 to 5 in. long, $\frac{1}{2}$ to 1 in. broad, entire or denticulate, more or less decurrent and confluent at the base. Veins numerous, simple or forked, parallel and diverging from the midrib, all free or rarely anastomosing. Spike or rather spike-like panicle 2 to 4 in. long, the peduncle at least as long above the barren lamina. Clusters of spore-cases short and crowded, each cluster usually terminating in a crest-like appendage (abortive spore-cases?)—*Bedd. Ferns S. Ind.* t. 69; *F. v. M. Fragm.* v. 118; *Bail. Litho. Ferns* Ql. 4.

Hab.: Rockingham Bay, *W. Hill. Dallachy*; Port Denison and Daintree River, *Fitzalan*; Rockhampton, *Thozet*; and many other tropical localities.

4. LYGODIUM, Swartz.

(From *lygodes*, flexible).

Climbing ferns, with long twining stems. Fronds pinnately or dichotomously divided, inserted on the common stem in divaricate pairs, usually on a very short common stalk or petiole. Pinnules usually ovate or lanceolate, at least when barren. Spore-cases globular or transversely oblong, with longitudinal striæ at the upper end, opening in a longitudinal slit, sessile in two rows, in sori forming small lobes bordering the pinnules or in a separate panicle, with a small scale under each spore-case.

A tropical genus widely spread over the New as well as the Old World.

Fronds palmately lobed

Fronds simply pinnate. Pinnules articulate on the petiole. Veins all free

Fronds simply pinnate or the lower pinnæ again pinnate. Pinnules articulate on the petiole. Veins often anastomosing

Fronds more or less bipinnate. Pinnules not articulate, often decurrent on the petiole. Veins all free

1. *L. dichotomum*.

2. *L. scandens*.

3. *L. reticulatum*.

4. *L. japonicum*.

1. ***L. dichotomum*** (divisions in pairs), Sw. Stem climbing. Primary petiole so much reduced that the fork seems almost to spring from the main rhachis; secondary 1 to 2 in. long, firm, naked. Pinnules digitate with 5 to 6 lobes reaching nearly down to the base, or once or even twice forked; ultimate barren divisions 4 to 8 or even 12 in. long, $\frac{1}{4}$ to $\frac{1}{2}$ in. broad, the fertile ones contracted, sometimes so much so that the lamina is nearly lost; the spikes 1 to 2 lines long, in close marginal rows; texture sub-coriaceous; surface naked.—Baker in Synopsis Filicum; Bail. Litho. Ferns Ql. 5.

Hab.: Musgrave Electric Telegraph Station, T. Barclay-Millar.

The portion forwarded was sterile and small, but doubtless belonged to the above species.

2. ***L. scandens*** (climbing), Swartz; Hook. and Bak. Syn. Filic. 487; Benth. Fl. Austr. vii. 691. Stems rather slender, but twining and climbing to a considerable extent, glabrous or slightly pubescent. Fronds of each pair pinnate. Pinnules 5 to 10 or more, from cordate-ovate to oblong-lanceolate or hastate, varying from $\frac{1}{4}$ to 1 $\frac{1}{2}$ in. long, often shortly lobed at the base, and always articulate on a slight thickening of the apex of the petiolule, which persists on the common rhachis after the pinnules have fallen off. Veins forked, free, radiating from the petiolule, with a more or less distinct central nerve. Sori protruding from the margins of pinnules similar to the barren ones, sometimes all very short with 3 to 6 pairs of spore-cases, sometimes in the same specimen 4 to 5 lines long, with 12 to 15 pairs of spore-cases.—Bedd. Ferns S. Ind. t. 61; *L. microphyllum*, R. Br. Prod. 162; F. v. M. Fragm. v. 118; Bail. Litho. Ferns Ql. 6.

Hab.: Sandy Cape, Hervey Bay, R. Brown; Cape York and Endeavour River, W. Hill, Daemel, N. Taylor; Rockingham Bay, Dallachy; Port Denison, Fitzalan; Rockhampton, Thozet; Brisbane River, Moreton Bay, A. Cunningham, F. v. Mueller. Mostly met with in swamps.

Widely spread over tropical Asia, received also from tropical Africa.

3. ***L. reticulatum*** (netted), Schkuhr, Spec. Filic. 189, t. 189; Benth. Fl. Austr. vii. 692. Habit of the larger specimens of *L. scandens*, and the pinnules similarly articulate on the petiolule, but usually larger, lanceolate, rather more rigid, often above 2 in. long, the lower ones of the frond often again pinnate, with 3 to 5 secondary pinnules. Veins forked, diverging from a central nerve and occasionally crossing each other or anastomosing. Sori small, usually numerous and crowded along the margins, each with 3 to 12 pairs of spore-cases.—Hook. and Bak. Syn. Filic. 489; *Hypoglossum scandens*, Presl; Bail. Ql. Ferns, 62; Bail. Litho. Ferns Ql. 7.

Hab.: York Peninsula, N. Taylor; Daintree River, Fitzalan; Rockingham Bay, Dallachy; frequently found in dense scrubs.

Also in the Pacific Islands where it is called "Wa Kalou," i.e. Fern of God, and was at one time used to decorate temples.

4. ***L. japonicum*** (of Japan), Swartz; Hook. and Bak. Syn. Filic. 489; Benth. Fl. Austr. vii. 692. Fronds pinnate as in *L. scandens*, but the pinnules much longer and narrower, not articulate but often very narrowly decurrent on the petiolule, and usually sprinkled with short hairs, the lower ones of each frond 3-fid or pinnate with 3 to 5 secondary pinnules, the central one lanceolate, varying from 1 to 6 in. long, the lateral ones shorter, entire, or toothed when barren, the veins free; fertile fronds either similar to the barren ones or reduced to a branched rhachis. Sori forming short linear marginal lobes as in *L. scandens*.—*L. semibipinnatum*, R. Br. Prod. 162, F. v. M. Fragm. v. 118; Bail. Litho. Ferns Ql. 8.

Hab.: Etheridge River, Gulliver; Cape York, Daemel; York Peninsula, N. Taylor; Endeavour River, A. Cunningham, G. Brown; Dayman's Isle, W. Hill; Rockingham Bay, Dallachy; found on the borders of rivers and scrubs.

Spread over the Malayan Archipelago, East Indies and Eastern Asia to Japan.

5. SCHIZÆA, Sm.

(From *schizo*, to split; from the split fronds.)

Rhizome short. Fronds erect, linear, terete or very narrow, simple forked or dichotomous, without expanded laminæ. Sori forming small linear pinnules, closely imbricate in a second spike at the end of the fertile branches, those of the two sides folded against each other with the fructification inside. Spore-cases globular, without any ring, opening in two valves, sessile in 2 rows covering the inner surface of the pinnules, which is really their under side, though from the curvature of the spike it may appear to be the upper one.

The genus extends over tropical and temperate America and the southern hemisphere of the Old World.

Fronds terete or nearly so, mostly bifid. Soriferous pinnules very narrow,

3 to 4 lines long 1. *S. bifida*.

Fronds repeatedly dichotomous. On sandy land near the coast 2. *S. dichotoma*.

Like the last but much smaller and glossy. Usually found on the roots of palms 3. *S. Forsteri*.

1. *S. bifida* (2-left), Swartz; Hook and Bak. *Syn. Filic.* 429; *Benth. Fl. Austr.* vii. 698. Fronds terete, 9 to 18 in. high, once forked at or below the middle or rarely undivided. Spike of the fertile ones $\frac{1}{2}$ to $\frac{3}{4}$ in. long, the soriferous pinnules very numerous and closely packed, narrow-linear, 3 to 4 lines long, fringed with long cilia. Spore-cases often 20 pair.—R. Br. *Prod.* 162; Sieb. *Fl. Mixt.* n. 228; Bail. *Litho. Ferns* Ql. 9A.

Hab.: Port Bowen, R. Brown; Rockingham Bay, Dallachy. Common in the south on forest land.

Also in New Zealand. Included by F. v. M. *Fragm.* v. 113, in *S. dichotoma*.

2. *S. dichotoma* (divisions in pairs), Swartz; Hook. and Bak. *Syn. Filic.* 430; *Benth. Fl. Austr.* vii. 694. Fronds 6 in. to above 1 ft. high, dichotomously divided into very numerous branches slightly flattened especially when barren, forming a flat corymbose top, all or most of them in some specimens fertile, in others all or most of them barren. Soriferous pinnules of the fertile spike very narrow and closely contiguous as in *S. bifida*, but usually smaller, varying from 1 to nearly 3 lines long.—R. Br. *Prod.* 162; Hook. and Grev. *Ic. Filic.* t. 17; Bedd. *Ferns S. Ind.* t. 65; F. v. M. *Fragm.* v. 113; Sieb. *Fl. Mixt.* n. 227; Bail. *Litho. Ferns* Ql. 10.

Hab.: Common all along the coast.

Extends over tropical America and Asia, the Mascarene and Pacific Islands, to New Zealand.

3. *S. Forsteri* (after G. Forster), Spreng; F. v. M. *Fragm.* viii. 275. Rhizome short scaly. Fronds 3 to 9 in. high, glossy. Stipes light-coloured, channelled, the upper portion of the frond dichotomously divided into several flat, thin segments, the fertile ones tapering to a neck-like contraction, thus giving the fructification an appearance of being stipitate, the tassel of fructification not so one-sided and much shorter than in *S. dichotoma*; Bail. *Litho. Ferns* Ql. 9 B.

Hab.: Northern and southern localities, usually found growing among the upper roots of palms.

6. ANGIOPTERIS, Hoffm.

(From *aggeion*, a vessel, and *pterus*, a fern.)

Trunk erect, almost arborescent. Fronds large, bipinnate, the stipes with 2 large persistent auricles at the base. Spore-cases globular, without any ring, opening inwards in two valves, sessile in two rows in oblong sori, placed side by side in a continuous row near the margins of the segments. No indusium.

The genus is limited by Hooker and others to the single Australian species, ranging over tropical and Eastern Asia to Japan and extending on the one hand to Madagascar and on the other to the Pacific Islands. It has been divided by De Vriese, *Monogr. Maratt.* 15, and some others into 63 species which, in so far as they may be discriminated, can only be considered as individual variations.—*Benth.*

1. **A. evecta** (evectie), *Hoffm.*; *Hook. and Bak. Syn. Filic.* 440; *Benth. Fl. Austr.* vii. 694. Trunk thick and erect, attaining sometimes 2 or 8 ft. Fronds spreading very broad, sometimes 12 to 15 ft. long, on a more or less pubescent stipes but otherwise quite glabrous, green and shining. Secondary pinnules or segments linear-oblong, 3 to 8 in. long, abruptly acuminate, crenate-serrate or rarely entire. Veins nearly parallel, diverging from the midrib, entire or forked. Spore-cases 4 to 6 pairs in each sorus.—*Hook. and Grev. Ic. Filic.* t. 86; *Hook. Filic. Exot.* t. 75; *Bail. Litho. Ferns* Ql. 11.

Hab.: Rockingham Bay, *W. Hill, Dallachy*; Daintree River, *Fitzalan*; Trinity Bay Ranges, *F. M. Bailey*; gullies of the Blackall Range.

7. MARATTIA, Sm.

(After J. F. Maratti, an Italian botanist.)

Rhizome large, tuberous. Fronds large, twice or thrice pinnate, the stipes with adnate auricles at the base. Spore-cases completely united in 2 rows, in oblong boat-shaped sori, placed side by side in a continuous row close to the margin of the pinnules or between the midrib and the margin, the spore-cases opening inwards in longitudinal slits without any other external mark to distinguish them, the sorus appearing divided into so many cells in 2 rows.

A genus of few species dispersed over the tropical regions of the New and the Old World and the southern extratropical ones of the Old World. The only Australian species has a general range in the Old World.—*Benth.*

1. **M. fraxinea** (ashen), *Sm. Ic. Ined.* t. 48; *Benth. Fl. Austr.* vii. 695. Potato Fern. Fronds 9 to 12 ft. long (*Dallachy*). Secondary pinnules or segments oblong-lanceolate, acuminate, often 8 in. long and $1\frac{1}{2}$ in. broad, but much smaller in other specimens, with numerous parallel simple or forked transverse veins, the barren point usually serrate, the fertile portion entire or shortly serrate. Boat-shaped sori rather above 1 line long, oblique and close together in a continuous row close to the margin, the vein on which they rest sometimes slightly expanded and fringed. Upper surface of the sorus concave, the slits and cells indicating the number of united spore-cases, 5 to 8 pair in each sorus.—*Hook. and Bak. Syn. Filic.* 440; *Bedd. Ferns* 8. Ind. t. 79; *M. salicina*, *Sm.*; *F. v. M. Fragm.* v. 114; *Bail. Litho. Ferns* Ql. 11.

Hab.: Rockingham Bay, *W. Hill, Dallachy*; York Peninsula, *N. Taylor*; Daintree River, *Fitzalan*; Bowen, *Woolfs*.

Spread over the tropical and southern extratropical regions of the Old World. The species should include several of those proposed by De Vriese, Monogr. Maratt. 3.

8. CERATOPTERIS, Brongn.

(From *keras*, *keratos*, a horn, and *pteris*, a fern; horned fern.)

Fertile fronds compound with narrow linear segments. Sori of single globular spore-cases opening irregularly, with an incomplete or rudimentary ring, inserted on longitudinal veins between the midrib and the margins of the segment. Indusium continuous and membranous, formed of the revolute margin of the segment. Spores large, marked with concentric rings.

The genus is limited to the single Australian species which is widely distributed over the tropical regions of the New and the Old World.

1. **C. thalictroides** (Thalicttrum-like), *Brongn.*; *Hook. Spec. Filic.* ii. 285, *Syn. Filic.* 174; *Benth. Fl. Austr.* vii. 695. An aquatic or semiaquatic fern. Fronds twice or thrice pinnate, the fertile ones 6 in. to 1 ft. high, the secondary or tertiary pinnæ short, with few distinct linear segments $\frac{3}{4}$ to above 1 in. long, the revolute margins enclosing the fructification of the whole length. Barren fronds distinct, shorter and more spreading, with fewer short broad

variously shaped segments, flat and of a soft half succulent texture. Spore-cases with a broad nearly complete ring.—Beddome, Ferns S. Ind. t. 75; Bail. Litho. Ferns, Ql. 12; *Parkeria pteridioides*, Hook. Exot. Fl. t. 147; Hook. and Grev. Ic. Filic. t. 97.

Hab.: Gulf of Carpentaria, *Landsborough*; Cape York, *Daemel*; Cape York Peninsula, *N. Taylor*; Rockingham Bay, *Dallachy*; Rockingham and neighbouring districts, *Bowman*, *O'Shanesy*; Moreton Bay, *F. v. Mueller*.

9. PLATYZOMA, R. Br.

(From *platys*, broad; *zoma*, a band; the ring of the sporangia broad.)

Fronds tufted on a horizontal rhizome, pinnate, the pinnules small and numerous along a simple rhachis. Sori of 2 to 4 spore-cases, terminating simple veinlets proceeding from the midrib, the soriferous end free and incurved between the frond and an inner membrane. Mature spore-cases globular, very deciduous, bursting irregularly, the inner membrane of the pinnule irregularly torn and disappearing.

The genus is limited to the single species endemic in Australia, the great difference in fructification as well as in habit preclude its union with *Gleichenia*.

1. ***P. microphyllum*** (leaf small), *R. Br. Prod.* 160; *Benth. Fl. Austr.* vii. 696. Braid Fern. Rhizome short, thick, densely covered with long brown setaceous scales. Fronds 6 in. to above 1 ft. high, the rhachis smooth and shining. Pinnæ exceedingly numerous, scarcely above 1 line long and broad, the revolute margins almost closed over the midrib so as to give them a globular or ovoid bullate form, glabrous outside, powdery inside especially on the midrib. Soriferous veins 2 or 3 on each side of the midrib.—Hook. and Bak. Syn. Filic. 11, t. 1, f. 1; Guillem. Ic. Pl. Austral. t. 18; *Gleichenia platyzoma*, *F. v. M. Fragm.* v. 114; Bail. Litho. Ferns Ql. 18.

Hab.: Gulf of Carpentaria, *R. Brown*, *Gulliver*; Facing Island, *R. Brown*, *W. Hill*; York Peninsula, *Taylor*; Rockingham Bay, *Dallachy*; Downs of the interior, *Mitchell*, *Woolle*, *Birch*, *Bowman* and others.

It is not easy in dried specimens to find the perfect sori in situ, for when ripe they are generally seen loose in the pinnule, and the inner membrane which confined them broken up or withered away.

10. GLEICHENIA, Sm.

(After Baron P. von Gleichen.)

Fronds from a creeping rhizome erect or scrambling, the main rhachis dichotomous, with numerous entire or pinnatifid pinnules, distichous along the ultimate branches and often also below the last forks. Sori without indusium, of few (2 to 12) spore-cases attached to one branch of forked veinlets, either superficial or slightly embedded in the substance of the frond. Spore-cases surrounded by a transverse ring and opening vertically in 2 valves.

The genus is spread over the tropical and subtropical regions of the New and the Old World extending into cooler regions in the southern hemisphere.

Pinnules divided to the midrib into numerous small segments, each with a single sorus.

Segments flat or with recurved margins, not bullate. Spore-cases usually 3 or 4, near the upper inner angle

1. *G. circinata*.

Segments bullate, the recurved margins almost closed over to the rhachis. Spore-cases usually 2, in a cavity more than half the breadth of the segment

2. *G. dicarpa*.

Pinnules entire or scarcely serrulate. Veinlets pinnate along the midrib, forked, each with a sorus on one branch.

Pinnules green on both sides, continued on the branches of the rhachis below the last fork. Sori of 3 or 4 spore-cases

3. *G. flabellata*.

Pinnules linear-lanceolate, sometimes glaucous underneath. Spore-cases about 4

4. *G. flagellaris*.

Pinnules glaucous underneath, only on the last branches of the rhachis above the last fork. Sori of 8 or more spore-cases

5. *G. dichotoma*.

1. *G. circinata* (coiled or curled round), *Swartz, Syn. Filic.* 165, 394; *Benth. Fl. Austr.* vii. 697. Parasol Fern. Fronds sometimes short, but often repeatedly dichotomous and scrambling to the height of many feet, the main rhachis glabrous or shortly scaly-hirsute. Pinnules numerous along the ultimate branches, 1 to 2 in. long, pinnately divided into numerous ovate or almost orbicular segments, 1 to 1½ lines diameter, adnate by the broad base, often whitish underneath, flat or the margins more or less recurved or revolute. Sori of 2 to 4 spore-cases, superficial or half immersed in a slight cavity near the upper basal angle of the segments.—*Hook. and Bak. Syn. Filic.* 11; *F. v. M. Fragm.* v. 115; *G. spelunca*, *R. Br. Prod.* 160; *Guillem. lc. Pl. Austral.* t. 12; *Sieb. Fil. Exs. n.* 87, and *Fl. Mixt. n.* 229; *G. microphylla* (rhachis hirsute), *R. Br. Prod.* 161; *Hook. f. Fl. Tasm.* ii. 180; *G. semivestita*, *Labill. Sert. Austr. Caled.* t. 11; *Bedd. Ferns Brit. Ind.* t. 177; *G. rupestris* (margins of segments recurved), *R. Br. Prod.* 160; *Bail. Litho. Ferns Ql.* 14.

Hab.: Moreton Bay and other southern localities.

Also in New Zealand, New Caledonia and the Malayan Archipelago and Peninsula.

2. *G. dicarpa* (2-fruited), *R. Br. Prod.* 161; *Benth. Fl. Austr.* vii. 698. Fronds of the smaller specimens of *G. circinata*, with the rhachis glabrous or scaly-hispid, but the segments, mostly under 1 line diameter, are almost globular and bullate, the revolute margins almost closed over to to the rhachis. Sori large in proportion, of 2 or rarely 3 spore-cases, in a broad cavity close to the rhachis, occupying more than half the breadth of the segment.—*Hook. Filic. Exot.* t. 40; *Kunze, Farrenkr.* t. 70, f. 2; *Hook. f. Fl. Tasm.* ii. 181; *F. v. M. Fragm.* v. 115; *Bail. Litho. Ferns Ql.* 15.

Hab.: Rockingham Bay, *Dallachy*; Moreton Island and other southern localities.

The species is also in New Zealand, New Caledonia and the Malayan Archipelago.

3. *G. flabellata* (fan-like), *R. Br. Prod.* 161; *Benth. Fl. Austr.* vii. 698. Fronds repeatedly dichotomous, attaining 2 to 4 ft. in height. Pinnules numerous along the last branches and continued along the rhachis below the last fork, linear-lanceolate, entire or the margins obscurely undulate, rarely above 1 in. long, dilated and sometimes confluent at the base, 1 to 1½ lines broad, glabrous or with a few scaly hairs underneath, the numerous veinlets proceeding from the midrib forked, one fork bearing below the summit a superficial sorus of 2 to 5, usually 3 or 4, spore-cases.—*Hook. Spec. Filic.* i. 6; *Filic. Exot.* t. 71; *Hook. and Bak. Syn. Filic.* 12; *Hook. fil. Fl. Tasm.* ii. 181; *F. v. M. Fragm.* v. 114; *Bail. Litho. Ferns Ql.* 16.

Hab.: York Peninsula, *N. Taylor*; Rockingham Bay, *W. Hill, Dallachy*; Brisbane River, Moreton Bay, *F. v. Mueller*.

The species is also in New Zealand and New Caledonia.

4. *G. flagellaris* (thong-like), *Spreng.*; *Baker in Fl. of Mauritius and the Seychelles*. Fronds 3 or 4 times dichotomously forked, leafy from the first-forking continuously to the top of the ultimate branchlets, the texture rigidly subcoriaceous, the upper surface dark-green and naked, the lower glaucous and with a little ferruginous down on the midrib of the segments. Pinnæ lanceolate, 1 to 2 in. broad, cut down to the rhachis into close adnate entire linear ultimate segments. Veins fine, distinct, once forked near the base. Sori on the back of the veins, nearer the edge than the midrib, consisting of not more than 4 or 5 capsules.—*Bail. Litho. Ferns Ql.* 18.

Hab.: Messrs. Schneider and Tryon brought me, from the top of the Macpherson Range, sterile portions of a *Gleichenia*, which I think belonged to the above species. It is a fern of wide range, having been gathered in New Guinea, Java, the Malay Islands, Fiji, Mauritius, Bourbon, and Madagascar, and is considered to include *G. levigata*, Willd.; *G. bifurcata*, Blume.; *G. bracteata*, Blume.; and *G. muricata*, Bojer.

5. *G. dichotoma* (divisions in pairs), Hook. *Spec. Filic.* i. 12; *Benth. Fl. Austr.* vii. 698. Fronds dichotomous. Pinnules undivided, linear or linear-lanceolate as in *G. flabellata*, but only on the last branches of the stipes above the last fork, mostly about 1in. long, rather rigid, glaucous underneath, dilated and often shortly confluent at the base, the lowest one on the outer side of the rhachis usually longer and more or less pinnatifid. Transverse veinlets proceeding from the midrib branching at the base, one branch bearing near the base a sorus of 8 to 12 spore-cases.—Hook. and Bak. *Syn. Filic.* 15; *Bedd. Ferns N. Ind.* t. 74; *Polypodium dichotomum*, Thunb.; *Mertensia dichotoma*, Willd.; Schkuhr, *Filic.* t. 148; *Gleichenia Hermannii*, R. Br. *Prod.* 161; F. v. M. *Fragm.* v. 114; *Bail. Litho. Ferns* Ql. 17.

Hab.: Shoalwater Bay, R. Brown; Daintree River, Fitzalan; Rockingham Bay, Dallachy; Brisbane River, and Islands of Moreton Bay.

On the Russel River this species is of a more slender growth and attains the height of 20 or 80ft.

Dispersed over the tropical and subtropical regions of the New and the Old World. R. Brown in transferring it from *Polypodium* to *Gleichenia* rejected Thunberg's specific name as being characteristic of the whole genus and therefore no longer appropriate for a single species. Willdenow nevertheless retained Thunberg's name, but placed the plant in *Mertensia*, now generally united with *Gleichenia*. Hooker first adopted Thunberg's specific name under *Gleichenia*, and has been followed by most others. The genera in ferns have been thrown into such confusion and uncertainty that pteridologists acknowledge a right of priority in specific names whatever may have been the genus under which they may have been first published.—*Benth.*

11. TODEA, Willd.

(After Henry Julius Tode.)

Trunk or rhizome erect. Fronds compound. Spore-cases globular, without any or only a very obscure transverse ring, opening to the base in 2 valves, clustered in sori on the under surface of the segments.

A genus of few species, dispersed over South Africa, the Malayan Peninsula, the South Pacific Islands and New Zealand.

Pinnules of a firm consistence, entire or serrulate. Sori at length covering the base of the lower pinnules.

Pinnules of a membranous half pellucid consistence, serrate. Sori of few small spore-cases close to the midrib 1. *T. barbara*.
 2. *T. Fraseri*.

1. *T. barbara* (of Barbary), T. Moore; Hook. and Bak. *Syn. Filic.* 427; *Benth. Fl. Austr.* vii. 699. Swamp Fern Tree. Trunk erect, attaining sometimes 5ft. Fronds varying from under 2ft. to above 8ft. long, glabrous, twice pinnate. Primary pinnæ numerous, from 3 or 4in. to 1ft. long. Pinnules numerous, of a firm consistence, narrow-lanceolate, $\frac{1}{2}$ to 2in. long, entire or more frequently serrate, the upper ones decurrent and confluent at the base. Sori on the oblique simple or forked veinlets, usually covering the greater part of the under surface of the lower pinnules of the lower pinnæ, the rest of the frond barren. Spore-cases rather large.—*Osmunda barbara*, Thunb.; R. Br. *Prod.* 168; *Todea africana*, Willd.; Hook. f. *Fl. Tasm.* ii. 153, t. 163; F. v. M. *Fragm.* v. 114; *Bail. Litho. Ferns* Ql. 19.

Hab.: Rockingham Bay, Dallachy; Bowen, Woolls; Moreton Bay, W. Hill; deep gullies of the Blackall Ranges.

Also in South Africa and New Zealand.

According to Hooker this fern was first named *Acrostichum barbara* by Linnaeus because of its African origin, but states that it is not a native of Barbary.

2. *T. (Leptopteris) Fraseri* (after C. Fraser), Hook. et Grev. *Ic. Filic.* t. 101, *Benth. Fl. Austr.* vii. 700. Trunk erect, 6in. to 3ft. high and seldom over 2 or 2½in. in diameter, more or less bearing the bases of the old fronds; the apex covered by somewhat glossy, short, obtuse scales; the crown of few fronds,

generally under 12. Stipes 10 to 15 in. long, terete or nearly so, with few scales, slightly stained with chestnut. Fronds 2 to 8 ft. long, lanceolate in outline, bipinnate; pinnae nearly opposite, about 80 on each side of rachis, the centre ones about 6 in. long and 1½ in. wide; secondary rachis narrowly winged; pinnules ½ in. long, 2½ lines broad, serrately lobed; veins simple or forked, 1 to each tooth or lobe; spore-cases minute, in masses of from 2 to 5 at the base of the pinnule.—Bail. Litho. Ferns. Ql. 20.

Hab.: In a deep rocky gully or creek on the summit of the south peak, Bellenden-Ker.

The thin dark-green pellucid fronds of this fern remind one of the New Zealand species *T. (Leptopteris) hymenophyllodes*.

The species is also in New Guinea and the South Pacific Islands.

12. TRICHOMANES, Linn.

(Name of uncertain application.)

Rhizome creeping, slender as in *Hymenophyllum* or short and rather thick. Fronds usually small, of a delicate membranous half pellucid texture, entire or variously divided and nerved. Sori terminal or lateral. Indusium of the texture of the frond and continuous with it, tubular or turbinate at the base and immersed in the margin of the frond or protruding from it, with a narrow usually spreading border entire or nearly so. Receptacle linear, usually exserted. Spore-cases sessile at or near its base.

A large genus, with the wide geographical range of *Hymenophyllum*, to which it is closely allied, differing only in the shape of the indusium.

- | | |
|---|------------------------------|
| Fronds round-cordate, nearly or quite sessile, usually less than 3 lines long. Sori solitary, exserted from a deep terminal sinus | 1. <i>T. Motleyi</i> . |
| Fronds linear almost cuneate, rarely lobed, seldom exceeding 4 lines. Sori solitary, terminal on frond or lobes, sessile | 2. <i>T. vitiense</i> . |
| Fronds ovate, frequently lobed, 4 to 6 lines, sometimes lobed at the top. Sori terminal, sessile | 3. <i>T. yandinense</i> . |
| Fronds sessile, orbicular, peltate, ½ to 1 in. diameter. Sori few | 4. <i>T. parvulum</i> . |
| Fronds undulate, irregularly lobed in the upper half or entire, tapering to the short stipes, 3 to 9 lines long. Sori terminal | 5. <i>T. muscoides</i> . |
| Fronds nearly orbicular, 3 to 4 lines diameter, palmatifid. Sori terminal | 6. <i>T. parvulum</i> . |
| Fronds deeply divided into 3 to 6 linear denticulate lobed segments. Sori terminal | 7. <i>T. digitatum</i> . |
| Fronds stipitate, 6 lines broad, more or less lobed. Sori 1 to 6 | 8. <i>T. cuspidatum</i> . |
| Fronds 6 lines long, pinnately-lobed; stipes scaly-hairy at the base, the lobes very narrow. Sori terminal | 9. <i>T. Kurzii</i> . |
| Fronds on long very slender stipites, deeply divided into irregular often distant segments | 10. <i>T. minutum</i> . |
| Fronds elongated, very slender, the segments distant-flabelliform. Sori terminal | 11. <i>T. proliferum</i> . |
| Fronds with stipites about 1 in. high, pinnae 3 or 4 lobed. Sori on the upper side of the pinnae distant from the axil | 12. <i>T. Wildii</i> . |
| Fronds ovate in outline, 1 to 2 in. high; pinnules pinnatifid; rachis winged in the upper part. Sori several to each pinnule | 13. <i>T. pyxidiferum</i> . |
| Fronds ovate in outline, 1 to 3 in. high; pinnules pinnatifid, segments sometimes acute. Sori often solitary near base of primary segments | 14. <i>T. filicula</i> . |
| Fronds like <i>T. pyxidiferum</i> , but stipites flat with ciliate margins. Sori towards the apex of frond | 15. <i>T. Barnardianum</i> . |
| Fronds 2 to 4 in. high, very delicate, pinnae rather distant and short. Sori usually 1 near the base of each pinna | 16. <i>T. venosum</i> . |
| Fronds ovate-lanceolate, 2 to 4 in. long, 1 to 2 in. broad, bipinnatifid, glaucous on the back. Sori axillary | 17. <i>T. pallidum</i> . |
| Fronds pinnate, 3 to 8 in. long, the pinnules narrow, bipinnatifid, often tapering to a point. Sori on the lower inner lobes of the segments | 18. <i>T. caudatum</i> . |
| Fronds bipinnate, 4 to 8 in. long, pinnules bipinnatifid, the ultimate lobes linear. Indusia above ½ line long and broad, with a broad 2 lobed border | 19. <i>T. apitifolium</i> . |
| Ultimate lobes setaceous. Indusia under ½ line long, with a small entire border | 20. <i>T. parviflorum</i> . |
| Fronds pinnate, 2 to 4 in. long, the lobes numerous, rather thick and broad, ciliate-toothed. Sori not numerous | 21. <i>T. javanicum</i> . |

- Fronds bipinnate, 3 to 6 in. long, with rather thick pinnatifid, stipites pinnules and linear toothed segments. Sori numerous 22. *T. rigidum*.
 Fronds bipinnate with a long running rhizome under ground. Stipites about 3 in. long, fronds about 5 in. long. Indusium 2-lipped 23. *T. johnstonense*.
 Fronds 12 to 18 in. long, 6 to 9 in. broad, stipites 3 to 6 in. long. Indusium not lipped 24. *T. maximum*.

1. **T. Motleyi** (after James Motley), *Bosch., Hymenoph. Javan.*; *Hook. et Baker, Syn. Filic.* 73. Fronds copious, imbricated, sessile or nearly so, about $\frac{1}{2}$ in. broad, cordate-orbicular, nearly entire; spurious veins indistinct, the solitary exserted indusium placed in a deep apical sinus, the mouth spreading and much dilated, but entire.—*Bedd. Ferns Brit. Ind. Pl.* 183; 8rd Suppl. *Syn. Ql. Fl.* 88; *Bail. Litho. Ferns Ql.* 21.

Hab.: Scrubs of the Johnstone and other tropical localities.

2. **T. vitiense** (of Viti), *Baker in Journ. Linn. Soc.* ix. 388, t. 8, D.; *Syn. Filic.* 74; *Benth. Fl. Austr.* vii. 701. Rhizome filiform. Fronds shortly stipitate, oblong or linear-cuneate, entire or rarely 2-lobed, 1-nerved, 3 to 5 lines long. Sorus nearly always single, terminal. Indusium with an oblong tube embedded in the margin or scarcely exserted, the border narrow, shortly spreading, entire. Receptacle shortly exserted.—*F. v. M. Fragm.* viii. 32; *Syn. Ql. Fl.* 686; *Bail. Litho. Ferns Ql.* 21.

Hab.: On tree-trunks in damp scrubs in northern and southern localities.
 Also in the Fiji Islands.

3. **T. yandinense** (of Yandina), *Bail.* Rhizome filiform, densely matted, hairy, hairs ferruginous. Fronds stipitate, ovate to cuneate, the margins even repand or lobed, 4 to 6 lines long. Veins pinnately costæform, between these are numerous strigæform ones, also an intramarginal one. Sori terminal, 1, 2 or 3. Receptacle slightly exserted.—*Syn. Ql. Fl.* 686; *Bail. Litho. Ferns Ql.* 21.

Hab.: Yandina and other southern scrubs.

4. **T. peltatum** (shield-like), *Baker in Linn. Journ. Soc.* ix. 386, t. 8, C.; *Syn. Filic.* 73; *Benth. Fl. Austr.* vii. 701. Rhizome filiform. Fronds sessile, orbicular, attached at or near the centre, overlapping each other and closely appressed, $\frac{1}{2}$ to 1 in. diameter, entire or shortly and broadly lobed. Veins numerous, entire or forked, radiating from the base or one principal one slightly pinnate. Sori few. Indusium with an oblong tube more or less imbedded in the margin, the border narrow, obscurely 2-lobed. Receptacle not exserted.—*Syn. Ql. Fl.* 686; *Bail. Litho. Ferns Ql.* 21.

Hab.: Trinity Bay and other tropical localities.
 Also in the islands of the South Pacific.

5. **T. muscoides** (moss-like), *Sw.* Rhizome creeping, tomentose, and like most of these small forms densely matted. Fronds from $\frac{1}{2}$ to $\frac{3}{4}$ in. long, much undulate, irregularly and some fronds deeply lobed, others nearly entire, stipes very short or wanting, the lamina tapering to the base. Costa prominent, the lateral veins simple or forked, joining at the margin into a vein and marginal band of reticulations. Indusium on the ends of the upper lobes of the frond, the mouth alone free, which latter is rather large and undulate. Receptacle of medium length.—*Bot. Bull.* iv.; *Bail. Litho. Ferns Ql.* 22.

Hab.: Barron River, on wood, *C. J. Wild.*

This Australian plant seems only to differ from the species described from other parts in its smaller size.

6. **T. parvulum** (small), *Poir.*; *Hook. Spec. Filic.* i. 118; *Syn. Filic.* 75; *Benth. Fl. Austr.* vii. 701. Rhizome filiform, tomentose or glabrous. Fronds shortly stipitate, ovate cuneate orbicular or almost reniform, 3 to 4 lines

diameter, unequally palmatifid, the deeper lobes reaching below the middle, all obtuse or emarginate. Sori terminal. Indusium with an oblong tube almost entirely imbedded in the margin, with a very short slightly spreading border. Receptacle included or shortly exserted.—Bail. Ql. Ferns, 60; Bail. Litho. Ferns Ql. 22.

Hab.: On rocks and logs in damp scrubs in both North and South localities.

Also in the Mascarene Islands, the Malayan Archipelago, East tropical Asia and the South Pacific Islands.

7. ***T. digitatum*** (finger-like), Swartz; Hook. Spec. Filic. i. 119; Syn. Filic. 76; Benth. Fl. Austr. vii. 702. Rhizome filiform. Fronds on a rather long capillary stipes, $\frac{1}{4}$ to $\frac{1}{2}$ in. long, deeply and unequally divided into 8 to 6 broadly linear obtuse entire or notched lobes, bordered by a few small teeth. Indusia broader than in most species, but imbedded in the apex of the lobes, with a very short open entire border.—*T. lanceum*, Bory; Hook. and Grev. Ic. Filic. t. 38; *T. calvescens*, V. de Bosch in Hook. and Bak. Syn. Filic. 77; Sw.; Bedd. Ferns Brit. Ind. Pl. 801.

Hab.: Found in southern localities with *T. parvulum*.

Spread over the Mascarene Islands, the Malayan Archipelago and the Pacific Islands.

8. ***T. cuspidatum*** (pointed), Willd.; Spec. Pl.; Hook. et Baker, Syn. Filic. 78. Fronds distinctly but very shortly stalked, about $\frac{1}{2}$ in. broad, the outer edge rounded and more or less lobed, the base truncate or more or less cuneate; spurious veins distinct. Indusia 1 to 6, the tube sunk in the frond, the mouth dilated, but scarcely 2-lipped.—Syn. Filic., l.c.

Hab.: On the Daintree River.—Pentzke, F. v. M. Sou. Sci. Rec. 1883.

Also in Asia and Africa.

I have not seen Queensland specimens of this species.

9. ***T. Kurzii*** (after S. Kurz), Bedd., Ferns of Brit. Ind. Pl. 286. Rhizome filiform, more or less tomentose. Fronds with stipites scarcely exceeding $\frac{1}{2}$ in. long, simply pinnately lobed; base of stipes scaly-hairy; lobes of frond narrow-linear, obtuse or almost acute, with costules but no lateral veins. Indusium sunk in the end of the lobe, mouth slightly lipped. Receptacle short.—Bail. Bot. Bull. iv. 19; Litho. Ferns Ql. 22.

Hab.: Daintree River, C. J. Wild.

The Australian plant only differs from the above in the greater regularity of the lobing of the fronds, which resembles a minute pinnate leaf.

10. ***T. minutum*** (very small), Blume, Filic. Javan.; Spec. Filic. i. 118. Rhizome filiform, creeping. Fronds densely matted on long slender stipites, the segments much cut or divided; but seems only to differ from *T. proliferum* in its much smaller size.—3rd Suppl. Syn. Ql. Fl. 88; Bail. Litho. Ferns Ql. 23.

Hab.: On wet rocks, Whelanian Pools, Bellenden-Ker.

11. ***T. proliferum*** (proliferous), Blume, Filic. Javan.; Spec. Filic. i. 118, t. 39. Rhizome creeping, densely matted. Fronds on long stipites, forked or branched and entangled, 2 or more inches long, segments deeply palmate or digitately divided into linear obtuse lobes. Indusium sub-cylindrical, mouth obscurely 2-lipped.—3rd Suppl. Syn. Ql. Fl. 88; Bail. Litho. Ferns Ql. 23.

Hab.: Whelanian Pools, on damp rocks.

12. ***T. Wildii*** (after C. J. Wild), Bail. Bot. Bull. iv. 19. Rhizome slender, tomentose, forming dense masses on bark. Frond including stipes about 1 in. high, pinnate, with pinnatifid pinnæ, stipes flattened as in *T. Barnardiana*, with a few dark hairs at the very base. Pinnæ few, distant, with 8 or 4 linear lobes,

veinless except the central costa. Indusium almost free on the upper side of the pinnæ some distance from the axil, mouth spreading but scarcely lipped.—Bail. Litho. Ferns. Ql. 27.

Hab.: Near Cairns, C. J. Wild.

13. **T. pyxidiferum** (box-bearing), *Linm.*; *Hook. Spec. Filic.* i. 124; *Syn. Filic.* 81; *Benth. Fl. Austr.* vii. 708. Fronds 1 to 2 in. long, ovate or oblong in outline, pinnate. Pinnules ovate, deeply pinnatifid or bipinnatifid, the lower ones usually distinct, the upper ones connected by a winged rhachis; lobes few, linear, 1-nerved. Indusia occupying nearly the whole of short lateral lobes, often several to each pinnule, oblong, with a broad orifice scarcely 2-lobed. Receptacles either very long or scarcely exerted.—*Hook. and Grev. Ic. Filic.* t. 206; *Bail. Litho. Ferns* Ql. 27.

Hab: York Peninsula, N. Taylor: Bellenden-Ker Range, Rockingham Bay, *Dallachy*.

Widely spread over the tropical regions of the New and the Old World.

14. **T. Filicula** (small fern), *Bory*. Rhizome filiform, clothed with short dark hairs, densely matted. Fronds 1 to 8 in. high, pinnatifid, somewhat ovate in outline; segments linear, sometimes acute. Indusium cylindrical, tapering towards the base, the mouth with two narrow, prominent acute lips.—*Bail. Litho. Ferns* Ql. 27.

Hab.: On wet rocks of the rivers of Tropical Queensland.

15. **T. Barnardianum** (after G. Barnard), *Bail. 8rd Suppl. Syn. Ql. Fl.* 89. Rhizome filiform, bearing short, stiff, dark-coloured, hair-like scales. Fronds mostly under 1 in. long, somewhat ovate to nearly palmate in outline, dark-green, glabrous except for a few minute fuscous elongated scales on the rhachis, pinnate with pinnatifid or bipinnatifid pinnæ, or the whole frond bi-tripinnatifid; ultimate segments narrow-linear, obtuse, with entire margins, decurrent at the base, forming wings to the short stipes; wings ciliate with a fringe of prominent linear dark fuscous hair-like scales; cells throughout very minute. Indusium rather large for the size of the frond, several towards the apex of the frond, urceolate-cylindric, the mouth spreading. Receptacles often long exerted and falcate.—*Bail. Litho. Ferns*, Ql. 27.

Hab.: On wet rocks, Palm Camp, Bellenden-Ker, 4,000ft.

This pretty little fern closely approaches the smaller forms of *T. pyxidiferum*, from which it may be easily distinguished by wider fronds, their very minute cell areolation, and ciliated wings of stipes.

16. **T. venosum** (veiny), *R. Br. Prod.* 159; *Benth. Fl. Austr.* vii. 702. Rhizome woolly-scaly. Fronds on a filiform stipes, of a very delicate texture, 2 to 4 in. or rarely longer, pinnate. Pinnules linear or lanceolate, mostly $\frac{1}{2}$ to 1 in. long, toothed or with a few short unequal lobes near the base, the veinlets of each pinnule pinnate, with simple or forked branches. the midrib flexuose. Indusium embedded in a short lobe near the base of the pinnule on the inner side, oblong, with a short spreading entire border. Receptacle usually exerted.—*Hook. Spec. Filic.* i. 132; *Syn. Filic.* 82; *Hook. and Grev. Ic. Filic.* t. 78; *Hook. f. Fl. Tasm.* ii. 135; *F. v. M. Fragm.* v. 116; *Bail. Litho. Ferns* Ql. 28.

Hab.: Southern localities.

17. **T. pallidum** (pale), *Blume, Filic. Javan.* Rhizome creeping, filiform, densely matted, tomentose. Stipes 1 to 2 in. long, wiry. Fronds 2 to 4 in. long, 1 to 2 in. broad, ovate-lanceolate, acuminate, bipinnatifid, just divided down to a narrowly-winged rhachis; lower pinnæ ovate-rhomboidal, divided more than half-way down, and the lobes again slightly cut; substance firm, glaucous on the under side and more or less clothed with light-brown hairs. Indusium

axillary on the segments on both sides, the tube deeply sunk, the mouth dilated but scarcely 2-lipped.—Syn. Filic. in part; Bail. Litho. Ferns. Ql. 24; *T. glauco-fuscum*, Hook. Spec. Filic. i. 128, t. 40a.

Hab.: On rocks, South Peak, Bellenden-Ker, 5,000ft.

18. ***T. caudatum*** (tailed), *Brackenr. Ferns U.S. Expl. Exped.* 286, t. 86, f. 5; *Benth. Fl. Austr.* vii. 708. Rhizome creeping, rigid, rather stout. Fronds narrow, thin, 8 to 8in. long, pinnate with pinnatifid pinnae or bipinnate with bipinnatifid pinnules, the ultimate segments linear, 1-nerved, the upper confluent ones short and rather distant, giving the pinnules an acuminate aspect. Indusia half immersed in the short lower inner lobes of the pinnules or segments, shortly oblong, with a narrow-spreading border. Receptacle usually exserted.—2nd. Suppl. Syn. Ql. Fl. 66; Bail. Litho. Ferns Ql. 28.

Hab.: Tallebudgera Creek, *H. Schneider*; Frasers Island, *W. Hill*.

Also in the South Pacific Islands, and closely allied to the tropical American *T. tenerum*, Sw. (*T. angustatum*, Carm.) to which it is referred by F. v. M. *Fragm.* v. 116.—*Benth.*

- 19. ***T. apifolium*** (Apium-leaved), *Presl.; Hook. and Bak. Syn. Filic. ed* 2, 86; *Benth. Fl. Austr.* vii. 708. Rhizome thick and knotty. Fronds 4 to 8in. long, broadly ovate-lanceolate in outline, bipinnate with deeply bipinnatifid pinnules. Primary pinnules 1 to 2in., secondary about $\frac{1}{2}$ in. long; segments very narrow-linear, thin, 1-nerved. Indusia almost embedded in the short inner lower lobes, the tube shortly turbinate, the border spreading often rather broad approaching that of a *Hymenophyllum*. Stipes short or long, hispid at the base with spreading bristles.—*T. Meisfolium*, Bory; Hook. Spec. Filic. i. 187; Syn. Filic. ed. 1, 86; *T. polyanthos*, Hook. Ic. Pl. t. 708.

Hab.: Usually only met with in dense wet scrubs as towards the Tweed River, rare.

Also in the Malayan Archipelago and South Pacific Island.

20. ***T. parviflorum*** (small-flowered), *Poir. Dict.* viii. 83; *Benth. Fl. Austr.* vii. 704. Rhizome creeping, rather thick. Fronds broadly lanceolate in outline, 3 to 5in. long, bipinnate with deeply pinnatifid or pinnate pinnules the segments divided into 2 or 3 almost setaceous lobes, giving the whole frond a fennel-like aspect. Indusia the smallest in the genus, not $\frac{1}{2}$ line long, on little recurved stipites near the base of the pinnules, turbinate, with a scarcely spreading border.—*T. faniculaceum*, Bory; Hook. Spec. Filic. i. 185, Syn. Filic. 88; Bail. Litho. Ferns Ql. 29.

Hab.: Eumundi, *Bailey and Simmonds*; Rockingham Bay, *W. Hill, Dallachy*; York Peninsula, *N. Taylor*.

Also in the Mascarene Islands and the Malayan Archipelago. Poirat's plant was identified by Mettenius from the original specimen, and his name substituted for Bory's by Kuhn, Filic. Afric. 35.

21. ***T. javanicum*** (of Java), *Blume.; Hook. Spec. Filic. i.* 180, *Syn. Filic.* 88; *Gard. Ferns*, t. 87; *Benth. Fl. Austr.* vii. 702. Fronds lanceolate in outline, often falcate, 3 to 4in. long, pinnate. Pinnules numerous, crowded along the rachis, lanceolate-falcate, shortly stipitate, about $\frac{1}{2}$ in. long, of a thicker consistence and darker coloured than most species, penniveined, the oblique simple or forked veinlets mostly produced into short setaceous teeth beyond the margin. Indusia few, along the inner margin below the middle, wholly exserted, narrow-oblong, with a small spreading border. Receptacle exserted.—Hook. and Grev. Ic. Filic. t. 240; Bedd. Ferns Brit. Ind. t. 180; Bail. Litho. Ferns Ql. 29.

Hab.: Daintree River, *Fitzalan* and other northern localities.

Also in the Malayan Archipelago.

22. **T. rigidum** (rigid), Swartz.; *Hook. Spec. Filic.* i. 138; *Syn. Filic.* 86; *Benth. Fl. Austr.* vii. 702. Rhizome short and thick. Fronds ovate-lanceolate or triangular in outline, 3 to 6 in. long, $1\frac{1}{2}$ to 3 in. broad at the base, dark and almost coriaceous, bipinnate, with deeply pinnatifid lanceolate pinnules and linear dentate segments, the primary and secondary rhachis winged only towards the end. Indusia partially embedded in the lower inner teeth or lobes of the tertiary segments, or sometimes wholly free without any winged margins, narrow, with a small spreading entire border. Receptacle exserted.—Bedd. Ferns S. Ind. t. 8; F. v. M. Fragm. v. 115; Bail. Litho. Ferns Ql. 25.

Hab.: In all coastal scrubs.

Very widely spread over the tropical regions of the New and Old World.

Var. *laxum*, Bail. Bot. Bull. iv. Rhizome short, thick and erect. Fronds 2 or 3 in. long, on slender stipes of 1 to $1\frac{1}{2}$ in., almost linear-lanceolate in outline. Pinnæ distant. Indusia small, receptacle long-exserted as in the normal form.—Bail. Litho. Ferns, Ql. 25.

Hab.: Near Herberton and other localities.

This small form is often met with in Queensland, growing with the common form, but always seems quite distinct enough to be given as a named variety.

23. **T. johnstonense** (of the Johnstone River), Bail., *Proc. Roy. Soc. Ql.* i. Rhizome long, creeping, rigid, knotted, clothed with black bristle-like scales. Stipes somewhat angular, scarcely winged, 2 to 4 in. long, of a dingy-brown colour, the immediate base scaly, as the rhizome. Fronds bipinnate, with deeply pinnatifid or bipinnate pinnules, 3 to 6 in. long, $1\frac{1}{2}$ to $4\frac{1}{2}$ in. broad, the rhachis slightly winged, the linear segments very narrow and 1-nerved. Indusia few on the lower lateral segments of the pinnule, free, erect, much tapering towards the base, the orifice 2-lipped. Receptacle exserted, usually long.—Bail. Litho. Ferns Ql. 26.

Hab.: Johnstone River and other tropical localities.

24. **T. maximum** (largest), Blume, *Filic. Javan.* Rhizome stout, creeping. Stipes strong, erect, 3 to 6 in. long. Frond 12 to 18 in. long, 6 to 9 in. broad, ovate, quadripinnatifid; pinnæ erecto-patent, ovate-lanceolate, the largest 4 to 6 in. long, 2 in. broad; pinnules lanceolate-deltoid, 1 in. or more long, cut down to the rhachis into segments, which are again deeply pinnatifid; ultimate segments $1\frac{1}{2}$ to 2 lines long, slightly flattened, texture subrigid, surface naked, dark-green; a central costa only in each segment. Indusia 2 to 3 to a pinnule; cylindric, the mouth dilated but not 2-lipped.—Syn. Filic. 86.

Hab.: Given as a Queensland plant in Muell. 2nd Syst. Cens. Austr. Pl. 280.

I have never seen Queensland specimens of this species.

13. HYMENOPHYLLUM, Sm.

(Membranous leaf.)

Rhizome slender, creeping, often much branched and matted. Fronds usually small, erect, of a delicate membranous half-pellucid texture, variously divided, the lobes usually linear 1-nerved. Sori terminal or lateral. Indusium of the texture of the frond and continuous with it, more or less cup-shaped at the base, and immersed in the margin of the frond, the exserted portion deeply divided into 2 broad lobes or valves. Receptacle oblong or linear, shorter than the indusium or rarely rather longer. Spore-cases sessile at or near its base.

A large genus, generally dispersed over most tropical and temperate regions of the globe, especially in America. In the northern hemisphere limited to America and the western parts of the Old World, always frequenting shady situations, with a moist atmosphere.—*Benth.*

Lobes of the fronds neither bordered nor toothed.

Stipes filiform not winged.

Frond bipinnate, with pinnatifid pinnules 1. *H. flabellatum*.

Stipes winged. Frond bipinnate 2. *H. javanicum*.

Lobes of the fronds minutely often sparsely, serrulate.

Fronds bipinnate, with divided pinnules, usually 2in. long or more.

Sori lateral near the base of the pinnules 3. *H. tunbridgense*.

Fronds 3 to 5in. long, stipes short, lobes linear, with entire margins.

Sori supra-axillary, deeply sunk on the lobe. Valves entire, receptacle always exserted 4. *H. trichomanoides*.

1. ***H. flabellatum*** (fan-shaped), *Labill. Pl. Nov. Holl.* ii. 101, t. 250; *Benth. Fl. Austr.* vii. 705. Fronds ovate or lanceolate in outline, sometimes broad and under 2in. long, more frequently elongated to 3 to 8in., twice or thrice pinnatifid, the lower segments or pinnæ distant, the rhachis as well as the stipes filiform and not winged, the upper smaller ones confluent with the narrowly-winged rhachis, the lobes not dentate. Sori lateral or terminating the smaller lobes. Indusium orbicular or rather broader than long, about $\frac{1}{2}$ line diameter, deeply divided into entire valves.—*Hook. Spec. Filic.* i. 111; *Hook. and Bak. Syn. Filic.* 61; *Hook. f. Fl. Tasm.* ii. 134; *H. nitens*, *R. Br. Prod.* 159; *Hook. and Grev. Ic. Filic.* t. 197; *Bail. Litho. Ferns Ql.* 30.

Hab.: Southern localities.

Also in New Zealand.

2. ***H. javanicum*** (of Java), *Spreng.; Hook. Spec. Filic.* i. 106, *Syn. Filic.* 60; *Benth. Fl. Austr.* vii. 705. Fronds ovate or lanceolate in outline, 3 to 4in. long, twice or thrice pinnatifid, the rhachis winged and the narrow wings continued down the stipes; segments and lobes linear-oblong, obtuse, not dentate. Sori on a short lateral lobe. Indusium ovate, about $\frac{1}{2}$ line long, divided nearly to the base into entire valves.—*H. flabellatum*, *R. Br. Prod.* 159, not of *Labill.*; *H. crispatum*, *Wall.*; *Hook. f. Fl. Tasm.* ii. 134; *H. demissum*, *F. v. M. Fragm.* v. 116, not of *Swartz.*; *Bail. Litho. Ferns Ql.* 31.

Hab.: Southern localities and northwards to Bellenden Ker Range.

Also in East India, the Malayan Archipelago and New Zealand.

3. ***H. tunbridgense*** (of Tunbridge), *Sm.; Hook. Spec. Filic.* i. 95, *Brit. Ferns*, t. 43, *Syn. Filic.* 67; *Benth. Fl. Austr.* vii. 706.—Rhizome filiform, much branched with numerous fronds, forming broad densely matted almost moss-like patches. Frond on a filiform stipes, lanceolate in outline, pinnate, rarely above 2 or 3in. long; the pinnæ deeply divided into 8 to 8 linear lobes minutely denticulate on the margin. Sori sessile or on a very short lobe, solitary on the base of the pinnæ on their upper margin. Indusium ovate or orbicular, about 1 line diameter, divided to much below the middle into more or less denticulate valves.—*R. Br. Prod.* 159; *Hook. f. Fl. Tasm.* ii. 153; *F. v. M. Fragm.* v. 116; *Bedd. Ferns S. Ind.* t. 265; *H. cupressiforme*, *Labill. Pl. Nov. Holl.* ii. 102, t. 250; *Bail. Litho. Ferns Ql.* 30.

Hab.: Mount Lindsay and other southern localities.

The species is widely spread over more temperate and cooler regions of the globe.

Var. *exsertum*, *Bail. 3rd Suppl. Syn. Ql. Fl.* 90. The Bristle-bearing Filmy Fern. This form differs in having a long bristle-like exserted receptacle; the indusium also was longer than usual. The receptacle is also exserted in the Lord Howe's Island specimens of this fern, but there the plant is of much coarser growth.—*Bail. Litho. Fern Ql.* 30.

Hab.: Summit of Bellenden-Ker.

4. ***H. trichomanoides*** (Trichomanes-like), *Bail. 3rd Suppl. Syn. Ql. Fl.* 90. Rhizome nearly or quite glabrous, filiform, creeping up the stems of trees in long strings, seldom if ever forming matted patches on old damp logs. Fronds

narrow or broadly lanceolate in outline; sometimes the apex is much elongated, 8 to 5in. long including the slender stipes, which is generally less than an inch long; the rhachis is very narrowly winged but not the stipes, bipinnate, the lower pinnules often somewhat flabelliform and more or less deeply divided, the upper pinnæ of from few to a single lobe, all linear, obtuse, with entire edges. Sori supra-axillary, deeply sunk on one or more of the lobes. Indusium oblong, $1\frac{1}{2}$ line long, the valves entire, obtuse, receptacle always protruding from 1 to more than 2 lines in length.—Bail. Litho. Ferns Ql. 81.

Hab.: Summit of Bellenden-Ker.

The outline form of this, especially when the pinnæ and pinnules are crowded, remind one of *H. polyanthos* of New Zealand, but it does not stain paper, and has not the fragrance of that fern, besides the difference of indusium and receptacle, which latter gives to this species the appearance of a *Trichomanes*. Indeed it might be placed in either *Trichomanes* or *Hymenophyllum*; I place it in the latter because the whole of the exerted portion of the indusium consists of the 2 long obtuse lobes.

14. CYATHEA, Sm.

(Indusium cup-like.)

Trees, with large twice or thrice pinnate or in species not Australian simple fronds, the transverse veinlets of the pinnules or segments forked or divided, bearing a sorus on one of their branches, the sori arranged in a single row on each side of the midrib. Sori globular, enclosed when young in a membranous indusium which after bursting leaves a cup or complete ring under the sorus. Spore-cases numerous, sessile or nearly so on a shortly raised receptacle, each with a vertical or oblong ring.

A large tropical or subtropical genus common to the New and the Old World.

Fruiting pinnules entire or slightly crenate-serrate. Sori in parallel lines on each side of the midrib.

Indusium large and long-persistent, enveloping the spore cases.

Rhachis and pinnules glabrous or nearly so 1. *C. Lindsayana*.

Rhachis and under surface of the pinnules cottony or woolly 2. *C. arachnoidea*.

1. ***C. Lindsayana*** (of Mount Lindsay), *Hook. Syn. Filic.* 25; *Benth. Fl. Austr.* vii. 708. Trunk 10 to 12ft. high, 12in. in circumference. Rhachis of the fronds quite glabrous. Secondary pinnæ 8 to 4in. long. The lower pinnules about $\frac{1}{2}$ in. long and 2 lines broad, the upper ones short and confluent, membranous, glabrous or with a few scaly hairs on the midrib, serrulate but not lobed. Sori in a double row very near the midrib and distant from the margin. Indusium long-persistent, opening irregularly at the apex.

Hab.: Mount Lindsay, W. Hill.

2. ***C. arachnoidea*** (spider-web like), *Hook. Syn. Filic.* 24; *Benth. Fl. Austr.* vii. 708. Trunk attaining 15 to 20ft. Rhachis of the fronds muricate and covered as well as the under side of the segments with a close whitish or ferruginous tomentum. Secondary pinnæ 3 to 5in. long. Pinnules or segments narrow, coriaceous, the lower ones 4 to 6 lines long and distinct, the upper ones smaller and confluent, somewhat coriaceous, the fertile portion with recurved crenulate margins. Sori in a single row on each side of the midrib but occupying nearly the whole breadth. Indusia persistent, globular, bursting irregularly at the apex.—F. v. M. *Frugm.* vi. 200.

Hab.: Rockingham Bay, *Dallachy*. Also in the Moluccas.

Dallachy's specimens are not in fruit, but are otherwise precisely similar to the Molucca ones from which the above character is taken.—*Benth.*

I have never seen plants or specimens of any Queensland species of this genus.

15. *ALSOPHILA*, R. Br.

(From the Greek; grove-loving.)

Trees, with large twice or thrice pinnate fronds, the transverse veinlets of the pinnules or segments forked or divided, bearing a sorus on one or both of their branches. Sori globular, without any indusium, but the small scales scattered on the veins occasionally subtending the sorus. Spore-cases numerous, sessile or nearly so, usually more or less intermixed with hairs on a slightly raised receptacle, each with a vertical or oblique ring.

A large tropical and subtropical genus in the New and the Old-World, differing from *Cyathea* only in the want of an indusium. Of the six Australian species one is also in Norfolk Island, the others appear to be endemic.

- | | |
|--|-------------------------------|
| Secondary pinnae undivided, entire or crenate-serrate | 1. <i>A. Rebecca</i> . |
| Secondary pinnae deeply pinnatifid, the segments all confluent at the base, ovate and entire | 2. <i>A. Loddigesii</i> . |
| Secondary pinnae pinnate at the base, the lower pinnules distinct, the upper ones confluent, all entire serrulate or slightly crenate. | |
| Pinnules or segments entire or obscurely crenate, serrulate only when barren or in the barren end | 3. <i>A. excelsa</i> . |
| Similar but smaller in all its parts than <i>A. excelsa</i> | 4. <i>A. australis</i> . |
| Pinnules narrow, very neat, usually serrulate with rather small sori | 5. <i>A. Leichhardtiana</i> . |
| Secondary pinnae pinnate, the pinnules almost all distinct narrow and pinnatifid, hispid as well as the rachis | 6. <i>A. Robertsiana</i> . |

1. *A. Rebecca* (after a lady friend of Baron von Mueller), *F. v. M. Fragm.* v. 58, 117; *Benth. Fl. Austr.* vii. 710. Trunk slender, often when broken down producing a cluster of stems, 10ft. high and 8in. diameter, or sometimes exceeding that height and diameter. Secondary pinnae dark and shining, undivided, lanceolate, 2 to 8in. long, 4 to 5 lines broad or rather more when barren, acuminate, crenate or obtusely serrate, obliquely truncate at the base but not adnate to the rachis. Transverse veinlets with 8 to 7 branches. Sori rather large, on 2 to 4 of the branches, forming about 2 irregular rows on each side of the midrib.—Hook. and Bak. *Syn. Filic.* 40; Hook. *Ic. Pl.* t. 1015; Bail. *Litho. Ferns* Ql. 82.

Hab.: Rockingham Bay, *Dallachy, W. Hill*; Port Denison and Daintree River, *Fitzalan*; Cape York Peninsula, *W. Hann's Expedition*. Very common on Bellenden-Ker.

Var. *commutata*. Wig Fern-tree. Trunk 6 to 12ft. or more high, slender, seldom exceeding a diameter of more than 2in. dark-coloured. Fronds 6 to 8ft. long, the stipes shortly appressed to the trunk for a few inches, and more or less clothed with simple or furcated long hair-like scales, which with the metamorphosed lower pinnae crown the stem with a wig-like growth, the divisions of which growth are narrow, much forked, and very intricate, hymenophylloid, and greenish or sometimes purplish, the larger pinnae about 2ft. long, pinnules 2 to 4in. long, the attenuated apex prominently serrated, the lower base with a rounded auricle, at times prominent, the upper truncate and parallel to the secondary rachis. Veins forked with 3 or 4 branches, alternating with simple ones. Sori forming erect heaps in one or two rows on the middle of the veins.—Bail. *Litho. Ferns* Ql. 33, 3rd Suppl. *Syn. Ql. Fl.* 91.

Hab.: Bellenden-Ker, in a damp gully at an altitude of 4,000ft.

This form, in the metamorphosis of its pinnae and pinnules, resembles the old species *A. capensis*.

2. *A. Loddigesii* (after Messrs. Loddiges, of Hackney), *Kunze in Linnæa*, xxiii. 221 (name only); *Baker Syn. Filic.* 458; *Benth. Fl. Austr.* vii. 710. Fronds apparently shorter than in *A. australis*, the rachis slightly tomentose or tuberculate, but soon glabrous and smooth. Secondary pinnae 2 to 8in. long, lanceolate, deeply pinnatifid, the segments all confluent at the base, more ovate than in *A. australis*, 3 to 4 lines long, 2 to 2½ lines broad, obtuse or almost acute, entire; transverse veinlets entire or once forked. Sori rather small, 1 to 4 on each side of the midrib of each segment.

Hab.: Recorded for Queensland by *F. v. M.*

3. **A. excelsa** (tall), *R. Br. Prod.*; *Hook. Sp. Fil.* i. 49. Common Fern-tree. Stems stout, the average height from 12 to 80ft. The frond large bipinnate, the stipes and main rhachis more or less muricate, and when young bearing chaffy scales mixed with wool; pinnules oblong-lanceolate acuminate, segments oblong rather acute, sometimes serrate at length coriaceous with the margins reflexed, the lower ones sub-auriculate at the base free and even slightly petiolate, the lower half or sometimes the whole segment bearing sori; veins often twice or thrice forked, spore-cases mixed with hairs.—*Hook. l.c. tab. xviii A.*; *Bail. Litho. Ferns Ql. 35 and 36.*

Hab.: Common in coastal scrubs.

4. **A. australis** (Australian), *R. Br. Prod.*; *Hook. Sp. Fil.* i. 50. Common Fern-tree. Stems as tall but not so stout as *A. excelsa*. The fronds similar to the last-mentioned but smaller in all their parts, the segments more acute. Sori 1 to 4 on the lower part of the segment; veins simple and forked, the spore-cases mixed with a few hairs.—*Hook. l.c. xix. A.*; *Bail. Litho. Ferns Ql. 34 and 37.*

Hab.: Common in coastal scrubs.

The species *A. excelsa* and *A. australis* scarcely differ from each other in anything but size, however, I think it will be found most convenient to retain them as distinct species and allow all the intermediate species and varieties which have been published from time to time to lapse, as all such seem to have only been conditions of growth.

5. **A. Leichhardtiana** (after L. Leichhardt), *F. v. M. Fragm.* v. 53, 117. *Benth. Fl. Austr.* vii. 711. Prickly Fern-tree. Trunk from 10 to 20ft. high, slender, hard and dark. Fronds large spreading, rhachis dark, rough or mucronate-spinulose, loosely tomentose or quite glabrous; ultimate pinnules more detached narrower and more serrate. Sori small, in very distinct series close to the midrib. Base of the stipes often covered with long brown setaceous hairs without the flattened scales of *A. australis*.—*Hook. and Bak. Syn. Filic. ed. 2, 40*; *Bail. Litho. Ferns Ql. 38*; *A. Macarthurii*, *Hook. l.c. ed. 1. 40.*

Hab.: Common in coastal scrubs.

6. **A. Robertsiana** (after William George Roberts), *F. v. M. Fragm.* v. 54, 117; *Benth. Fl. Austr.* vii. 712. Trunk smooth, 10 to 12ft. high, 2 to 4in. diameter, elongated beyond the last frond. Fronds not forming a crown, but are somewhat distantly placed on the stem; bipinnate, the rhachis both general and partial as well as the pinnules themselves and sori hispid or sprinkled with rigid hairs. Secondary pinnae 2 to 3in. long. Pinnules distinct, 4 to 6 lines long, deeply pinnatifid, the upper ones of each pinna smaller, more entire and confluent. Sori rather large, solitary opposite each lobe of the pinnule.—*Hook. and Bak. Syn. Filic. 459*; *Bail. Litho. Ferns Ql. 39.*

Hab.: Rockingham Bay, *Dallachy*; Bellenden-Ker Range, *W. Hill and Bailey.*

16. DICKSONIA, L'Her.

(After James Dickson, a British cryptogamist.)

Trunk arborescent or rhizome creeping. Fronds large, compound. Pinnules pinnatifid. Sori terminating veins close to the margins of the frond. Indusium either globular and 2-valved or cup-shaped and entire, the upper valve or upper part of the cup adnate to the frond and continuous with the margin.

The genus extends over the tropical and subtropical regions of the New and the Old World.

Sori on the concave lobes of the pinnules, which are closely adnate to and form the greater part of the upper valve of the indusium. Trees.

Indusium about $\frac{1}{2}$ line diameter 1. *D. antarctica.*

Indusium about 1 line diameter 2. *D. Youngiae.*

Sori under the sinus or at the inner base of the lobes of the pinnules.

Indusium cup-shaped. Rhizome creeping 3. *D. davallioides.*

1. ***D. antarctica*** (antarctic), *Labill. Pl. Nov. Holl.* ii. 100, t. 249; *Benth. Fl. Austr.* vii. 712. Woolly Fern-tree. Trunk arborescent, attaining 30 to 50ft., covered with matted rootlets giving it sometimes a diameter of 4ft. Fronds 6 to 12ft. long, twice or thrice pinnate, the stipes smooth or with setaceous scales, the rhachis glabrous minutely scabrous or softly hairy when young. Secondary pinnae 2 to 8in. long. Pinnules or segments distinct or the upper ones confluent, nearly flat and acutely toothed when barren, thicker and obtusely lobed when fertile. Sori solitary on each lobe. Indusium globular, about $\frac{1}{2}$ line diameter, 2-valved, the upper valve adnate to the lobe of the frond and undistinguishable from it except near the base where there is on each side a narrow free margin.—*Hook. Spec. Filic.* i. 66, *Syn. Filic.* 50; *R. Br. Prod.* 157; *Hook. f. Fl. Tasm.* ii. 182; *F. v. M. Fragm.* v. 117, vi. 199; *Bail. Litho. Ferns Ql.* 40.

Hab.: Recorded for Queensland by *F. v. M.*

Also in New Zealand.

2. ***D. Youngiae*** (after Lady Young), *C. Moore in Bak. Syn. Filic.* 461; *Benth. Fl. Austr.* vii. 718. Trunk 10 to 12ft. high, 8 to 8in. diameter, marked by the bases of old fronds. Fronds somewhat coriaceous and glossy. Stipes covered with glossy-brown hair; rhachis ferruginous-pubescent or glabrous, not scabrous. Secondary pinnae 2 to 8in. long. Pinnules 8 to 6 lines long when fertile, deeply divided into round lobes. Indusium 1 line diameter, the upper valve entirely adnate.—*Bail. Litho. Ferns Ql.* 41.

Hab.: Bellenden-Ker Range, *W. Hill*; Bunya Mountains, *J. F. Bailey*.

3. ***D. davallioides*** (Davallia-like), *R. Br. Prod.* 158; *Benth. Fl. Austr.* vii. 718. Rhizome creeping. Fronds erect, 2 to 5ft. high, the rhachis straight or flexuose, smooth and shining. Secondary pinnae 3 to 4in. long. Pinnules numerous, distinct, $\frac{1}{2}$ to 1in. long, membranous, pinnatifid, the lowest lobe on the upper side longer than the others. Sori small, globular, almost marginal, in the sinus or at the base of the upper side of the lobes of the pinnules. Indusium cupular, about $\frac{1}{2}$ line diameter, entire or scarcely lobed, adnate on the upper side to the frond.—*Hook. Spec. Filic.* i. 71; *Syn. Filic.* 54; *Bail. Litho. Ferns Ql.* 42; *D. nitidula*, *Mett. Filic. Hort. Lips.* 106, t. 28; *Dennstaedtia davallioides*, *T. Moore*; *Bail. Ql. Ferns*, 54.

Hab.: Near Brisbane and many other southern localities.

17. DAVALLIA, Sm.

(After Edmond Davall).

Rhizome creeping, often densely covered with soft scales or setae. Fronds compound, often large, or rarely in species not Australian undivided. Sori globular or slightly elongated, terminating veins close under or at a little distance from the margin. Indusium from under the sorus either with the margins adnate to the frond and forming with it a complete cup enclosing the sorus, or attached only by its broad base and either covering the sorus, or short and open under it.

The genus is widely spread over the tropical and subtropical regions of the Old World extending to the Mediterranean, with a few tropical American species.

Fronds coriaceous. Indusium with adnate margins forming a complete cup.

Pinnules oblong, obtusely lobed. Indusium narrow-oblong 1. *D. solida*.

Pinnules lanceolate, acutely lobed. Indusium ovate.

Pinnules marked with raised striæ 2. *D. elegans*.

Pinnules flat, the nerves slightly depressed 3. *D. pyxidata*.

Fronds coriaceous. Indusium attached only by its broad base.

Fronds rarely above 3in. long above the stipes. Indusium orbicular, covering the sorus 4. *D. pedata*.

Fronds large and compound. Indusium short and broad under the sorus 5. *D. dubia*.

Fronds membranous. Indusium attached only by its broad base, short and broad under the sorus.

Secondary pinnae lanceolate, 2 to 4 in. long. Lower pinnules $\frac{1}{2}$ to $\frac{3}{4}$ in. long, broad and pinnatifid, upper ones confluent 6. *D. spelunca*.

Secondary pinnae oblong, $\frac{1}{2}$ to 1 in. long. Pinnules 2 to 4 lines long, with 2 to 4 obovate obtuse lobes 7. *D. tripinnata*.

1. ***D. solida*** (solid), Swartz; Hook. Spec. Filic. i. 163, t. 42, Syn. Filic. 95; Benth. Fl. Austr. vii. 715. Rhizome rather thick, densely clothed with setose appressed scales. Fronds from under 1 ft. to near 2 ft. long, rather broad, twice or thrice pinnate or pinnatifid. Pinnules coriaceous, $\frac{1}{2}$ to $1\frac{1}{2}$ in. long, the lower larger ones distinct and deeply pinnatifid, the upper ones confluent and obtusely lobed. Sori at the base of the crenatures or lobes. Indusium narrow-oblong, $\frac{3}{4}$ line long, the margins adnate, forming with the frond a complete cup or tube.—Bedd. Ferns Brit. Ind. t. 104; Bail. Litho. Ferns Ql. 43.

Hab.: Hummocky Islands, Thozet.

Also in the Malayan Archipelago and South Pacific Islands.

2. ***D. elegans*** (elegant), Swartz; Hook. Spec. Filic. i. 164, t. 43, Syn. Filic. 95; Benth. Fl. Austr. vii. 715. Rhizome thick scaly and woolly. Fronds rather large, 3 or 4 times pinnate, the pinnae often tapering into long points. Pinnules lanceolate, deeply pinnatifid, coriaceous, smooth shining and elegantly marked with raised striæ distinct from the veins. Sori on small truncate or bidentate lobes or teeth. Indusium ovate, about $\frac{1}{2}$ line long and broad, the margins adnate and forming with the tube a complete cup, the number of these little shining indusia elegantly contrasting with the darker frond.—R. Br. Prod. 157; Bail. Litho. Ferns Ql. 42.

Hab.: Endeavour River, Banks and Solander, A. Cunningham; York Peninsula, N. Taylor; Rockingham and Cleveland Bays, W. Hill, Dallachy, Bowman; Fitzroy Islands, Walter; Rockhampton, O'Shanesy; commonly found rambling over rocks.

Widely spread over tropical Asia and Africa.

3. ***D. pyxidata*** (indusium box-like), Cav.; Hook. Spec. Filic. i. 169, t. 55; Syn. Filic. 96; Benth. Fl. Austr. vii. 716. Hare's-foot fern. Epiphyte. Rhizome thick, densely covered with soft scales. Fronds usually under 1 ft. long and nearly as broad, on a stipes half as long, twice or thrice pinnate. Pinnules coriaceous smooth and shining, the lobes and segments shorter and broader than in *D. elegans*, without the raised striæ of that species, the veins slightly depressed. Sori on the lobes or teeth. Indusium ovate, sometimes as broad as in *D. elegans*, but more frequently rather narrower, the margins adnate, when young almost immersed in the frond.—R. Br. Prod. 157; Bail. Litho. Ferns Ql. 45.

Hab.: Brisbane River, Moreton Bay, F. v. Mueller and other; Rockhampton and neighbouring districts, Dallachy, Thozet, O'Shanesy; Rockingham Bay, Dallachy; a very common fern.

Also in Norfolk Island, and New Caledonia, and scarcely to be distinguished from the well-known *D. canariensis* of the West Mediterranean region.—Benth.

4. ***D. pedata*** (divisions of frond supposed to resemble a bird's foot), Sm.; Hook. Spec. Filic. i. 154, t. 45, Gard. Ferns, t. 7, Syn. Filic. 89; Benth. Fl. Austr. vii. 716. Rhizome scaly, often very long. Fronds ovate-triangular, $1\frac{1}{2}$ to 3 in. long, on a stipes usually as long or longer, coriaceous, deeply pinnatifid, the lowest pair of segments usually again pinnatifid and deeply so on the outer side, the others gradually smaller and entire or scarcely crenate, obtuse or truncate. Sori at the base of the crenatures at the end or upper half of the segments. Indusium nearly orbicular, rather above $\frac{1}{2}$ line diameter, closely appressed and covering the sorus but attached only by the broad base.—Bail. Litho. Ferns Ql. 46; Humata pedata, J. Sm.; Bedd. Ferns S. Ind. t. 12.

Hab.: Cape York Peninsula, N. Taylor; Rockingham Bay, W. Hill, Dallachy; Bowen, Woolls. Common on rocks in tropical localities.

Also in tropical Asia and the Mascarene Islands.

5. ***D. dubia*** (doubtful), *R. Br. Prod.* 157; *Benth. Fl. Austr.* vii. 716. Mountain Bracken. Fronds large, resembling those of *Dicksonia davallioides* but more rigid, twice or thrice pinnate. Pinnules $\frac{1}{2}$ to $1\frac{1}{2}$ in. long, lanceolate, deeply pinnatifid and the lowest segments often again toothed or lobed, somewhat coriaceous. Sori at the base of the obtuse teeth or lobes which are often curved over them as in *Dicksonia* but quite independent of them. Indusium about $\frac{1}{2}$ line broad and very short, attached only by the broad base as in *D. pedata*, without any trace of the upper valve or complete ring of *Dicksonia*.—Hook. and Bak. *Syn. Fil.* 468; Sieb. *Filic. Exs.* n. 111, *Fl. Mixt.* n. 247; Bail. *Litho. Ferns* Ql. 47; *Dicksonia dubia*, Gaudich. in Freyc. *Voy. Bot.* 367; Hook. *Spec. Filic.* i. 71, t. 24; Hook. f. *Fl. Tasm.* ii. 132; *Balantium Brownianum*. Presl. *Pteridogr.* 134.

Hab.: Moreton Bay, *F. v. Mueller*; Port Denison and Mount Elliott, *Fitzalan*; Rockingham Bay, *Dallachy*; usually found on hillsides.

6. ***D. speluncæ*** (of caves), *Baker, Syn. Fil.* 100; *Benth. Fl. Austr.* vii. 717. Fronds large, twice or thrice pinnate. Secondary pinnæ lanceolate, 2 to 4 in. long, pinnate in the lower part, pinnatifid towards the end, membranous, hairy underneath as well as the rhachis. Lower pinnules $\frac{1}{2}$ to $\frac{3}{4}$ in. long, pinnatifid, the upper ones gradually smaller and confluent, reduced towards the end to small lobes. Sori several on each pinnule below the sinus of the lobes, forming 2 rows at some distance from the margin. Indusium broad, short, membranous, slightly toothed or jagged, attached only by the broad base.—Bail. *Litho. Ferns* Ql. 48; *Polypodium speluncæ*, Linn.; *Microlepia speluncæ*, T. Moore; Bail. *Ql. Ferns*, 52; *Davallia flaccida*, *R. Br. Prod.* 157; *F. v. M. Fragm.* v. 118, *D. polypodioides*, Don; Hook. *Spec. Filic.* i. 181.

Hab.: Endeavour River, *Banks and Solander*; Broadsound, *Bowman*; Rockingham Bay, *W. Hill, Dallachy*. A common fern of tropical localities.

Widely spread over tropical Asia and Africa.

7. ***D. tripinnata*** (3-pinnate), *F. v. M.*; *Benth. Fl. Austr.* vii. 717; *Bail. 3rd Suppl. Syn. Ql. Fl.* 91, with plate. Hairy Fern. Stem very short, bearing at its apex a crown of softly hairy fronds, hairs nearly white. Frond 8 or more in. long, 6 in. broad at the base, on a hairy stipes of 6 in., thrice pinnate, the main rhachis hairy. Primary pinnæ lanceolate, secondary oblong $\frac{1}{2}$ to 1 in. long, pinnules 2 to 4 lines, deeply divided into 2 to 4 obovate obtuse lobes dark green on both sides but rather thin, the lower pinnæ and pinnules quite distinct, the upper ones smaller and confluent at the base. Sori few or numerous under the sinus of some of the smaller lobes. Indusium membranous, broad and somewhat jagged, attached only by the broad base.—Bail. *Litho. Ferns* Ql. 49.

Hab.: On the Bellenden-Ker Range, first found by *W. Hill*. In 1889 I found it very abundant in the dark damp gullies of the same Range.

18. VITTARIA, Sm.

(From *vitta*, a ribbon; shape of frond.)

Rhizome creeping. Fronds simple, linear, the very oblique veins connected in an intramarginal vein. Sori continuous along the intramarginal vein, with a two-valved indusium of the substance of the frond, opening from the outer margin inwards as an inner valve, the margin of the frond recurved over the sorus forming the outer valve, the sorus thus appearing embedded in a double margin of the frond.

The genus is limited to a very few species dispersed over the tropical regions of the globe.

Fronds from a few in. to 2 ft. long, and 1 to 5 lines broad 1. *V. elongata*.

Fronds 4 to 5 in. long and $1\frac{1}{2}$ line broad 2. *V. falcata*.

Fronds 1 to $1\frac{1}{2}$ in. long and 2 to 3 lines broad 3. *V. woorenooran*.

1. **V. elongata** (elongated), Swartz; Hook. and Bak. *Syn. Filic.* 395; Benth. *Fl. Austr.* vii. 718. Rhizome creeping, covered with black or purple hair-like scales. Fronds varying from 2 or 3 in. to 2 ft. in length, 1 to 2 lines broad when fertile, 2 to 5 lines when barren, acute obtuse or truncate at the end, gradually tapering into a short stipes, of a rather coriaceous texture. Veins very oblique, sometimes almost parallel with the midrib and all as well as the midrib embedded in the substance of the frond. Sori usually extending nearly the whole length of the fertile fronds.—R. Br. *Prod.* 153; Leurss. in Schenk and Leurss. *Mittheil.* Bot. i. 90, t. 11; Bedd. *Ferns S. Ind.* t. 21; Bail. *Litho. Ferns Ql.* 50.

Hab.: Broadsound, R. Brown; Cape York, Daemel; Rookingham Bay, Dallachy; Daintree River and Mount Elliott, Fitzalan; Islands off the coast, A. Cunningham; Maroochie, Bail.; Tallebudgera, Schneider.

2. **V. falcata** (sickle-shaped), Kunze; Fée, *Vittar.* p. 20, t. 4, f. 1; Hook. *Spec. Filic.* v. 182; *Syn. Filic.* 395. Fronds 4 or 5 in. long, $\frac{1}{2}$ in. broad, the point blunt, the lower part narrowed gradually to the base; texture leathery and very thick; a distinct raised midrib attaining the apex in the barren fronds, but lost in the fertile ones; veins short, oblique, parallel, immersed; sori quite sunk in slightly intramarginal grooves.

Hab.: Bellenden-Ker.—Sayer, F. v. M. *Sou. Sci. Rec.* 1887.

3. **V. wooroonooran** (the aboriginal name for Bellenden-Ker), Bail. *3rd Suppl. Syn. Ql. Fl.* 92. Rhizome erect or slightly repent, clothed with long, light-brown, linear-lanceolate scales. Fronds 1 to 1 $\frac{1}{2}$ in. long, 2 to 3 lines broad, coriaceous, spreading horizontally, very obtuse, tapering to a very short stipes, bearing minute, scattered, setose scales; veins once forked from a central costa, but both concealed by the thick substance of the frond; sori continuous in a groove more or less distant from the margin on the upper part of the frond, but never meeting at the apex.—Bail. *Litho. Ferns Ql.* 50.

Hab.: On rocks amongst moss at an elevation of from 4,000 to 5,000 ft., Bellenden-Ker.

In some respects this species approaches *V. falcata*.

19. LINDSÆA, Dryand.

(After Dr. Lindsay.)

Rhizome creeping or shortly horizontal. Fronds pinnate or compound. Sori in a continuous or rarely interrupted line under the margin of the frond, with a continuous indusium opening along the upper or outer margin, the margin of the frond sometimes slightly dilated and assuming the appearance of an upper valve. Veins forked, free or anastomosing.

A considerable tropical and subtropical genus, common to the New and the Old World.

Pinnules obliquely flabellate, one side of the base longer than the inner.

Rhizome creeping. Fronds simply pinnate; rhachis black, wiry. Pinnules small, distant

1. *L. linearis*.

Rhizome short. Fronds tufted, simply pinnate; rhachis slender. Pinnules small, distant, often bipartite

2. *L. dimorpha*.

Rhizome short. Fronds tufted, simply pinnate. Pinnules near together, 3 to 4 lines broad

3. *L. cultrata*.

Rhizome creeping. Frond pinnate and bipinnate. Pinnules often $\frac{1}{2}$ in. broad

Veins forked, all free or very rarely anastomosing

4. *L. flabellulata*.

Veins in most of the pinnules more or less anastomosing

5. *L. lobata*.

Pinnules obovate or cuneate, equilateral. Veins free.

Fronds bipinnate, the rhachis slender flexuose. Pinnules cuneate-truncate, 1 to 2 lines long

6. *L. microphylla*.

Fronds very slender, pinnate. Pinnules small deeply divided into 2 or 3 cuneate lobes, 1 to 2 lines long

7. *L. incisa*.

Primary pinnules entire lanceolate, or pinnate with short secondary pinnules.

Veins anastomosizing.

Primary pinnules ovate-lanceolate, undivided, 4 to 8 lines long 8. *L. Fraseri*.

Primary pinnules lanceolate, 1 to 4 in. long, entire or wholly or partially pinnate with short secondary pinnules 9. *L. ensifolia*.

Primary pinnules lanceolate, coriaceous, entire, woolly-tomentose underneath. Veins free 10. *L. lanuginosa*.

1. ***L. linearis*** (linear), Swartz.; Hook. *Spec. Filic.* i. 206, *Syn. Fil.* 104; *Benth. Fl. Austr.* vii. 719. Rhizome creeping. Fronds simply pinnate, the stipes and the rhachis wiry, black and glabrous, from 2 or 3 in. to above 1 ft. high, very fragile. Pinnules distant, very obliquely cuneate or flabellate almost dimidiate, the base very unequal, 8 to 4 lines broad. Sori forming a continuous line under the outer margin.—R. Br. *Prod.* 156; Hook. f. *Fl. Tasm.* ii. 186; Kunze in *Pl. Preiss.* ii. 118, *F. v. M. Fragm.* v. 119; Sieb. *Fl. Mixt.* n. 233; Bail. *Litho. Ferns* Ql. 51.

Hab.: Brisbane River, Moreton Bay, *F. v. Mueller, Bailey*; Nerang, *Schneider*; and Stanthorpe. Also in New Zealand, New Caledonia and Norfolk Island.

2. ***L. dimorpha*** (of 2-forms), *Bail. Ql. Ferns*, 19; *Benth. Fl. Austr.* vii. 719. Rhizome tufted. Fronds simply pinnate, the barren ones mostly 2 in. long or rather more, with a few broad flabellate pinnules, toothed and shortly lobed, scarcely oblique. Fertile fronds much longer, the stipes and rhachis very slender and pale-coloured. Pinnules either broadly flabellate very oblique and undivided as in *L. linearis* or once or twice bipartite as in *L. incisa*.—Bail. *Litho. Ferns* Ql. 51; *L. heterophylla*, *Prent.* in *Trim. Journ. Bot.* 1873, 295, not of Dryand.

Hab.: Eight Mile Plains, *Prentice*; Glass-house Mountains and Kedron Brook, *Bailey*. A very distinct species readily recognised by the slender tufted fronds.

3. ***L. cultrata*** (knife-like), Swartz.; Hook. *Spec. Filic.* i. 209, *Syn. Filic.* 105; *Benth. Fl. Austr.* vii. 719. Rhizome tufted or very shortly creeping. Fronds simply pinnate, 3 to 6 in. long, the stipes and rhachis wiry but slender and pale-coloured. Pinnules near together, occupying the greater part of the frond, very oblique or half reniform, 3 to 4 lines broad, the rounded outer margin entire, with the sorus and indusium continuous or slightly lobed or denticulate interrupting the sori.—Hook. and Grev. *Ic. Filic.* t. 144; *Bedd. Ferns* 8. Ind. t. 28; Bail. *Litho. Ferns* Ql. 52; *Davallia brachypoda*, *Baker, Syn. Filic.* 468; *Lindsaea concinna*, *J. Sm.*; Bail. *Ql. Ferns* 18.

Hab.: York Peninsula, *Hann's Expedition, N. Taylor*; Bellenden-Ker Range, *W. Hill*; Gilbert River, *Daintree*; Maroochie, *Bailey*; Tallebudgera, *Schneider*. Also in the Mascarene Islands and tropical and eastern Asia up to Japan.

4. ***L. flabellulata*** (fan-like), *Dryand in Trans. Linn. Soc.* iii. 41, t. 8; *Benth. Fl. Austr.* vii. 720. Rhizome creeping. Fronds 6 in. to 1 ft. high, usually bipinnate 2 or more of the lower pinnæ being again pinnate and 2 to 4 in. long, the upper pinnæ entire but sometimes the whole frond simply pinnate or in other specimens more or less tripinnate. Pinnules oblique, in the simply pinnate part flabellate or almost rhomboid often $\frac{1}{2}$ in. broad, smaller in the more compound specimens. Veins forked, free or rarely here and there anastomosizing. Sori continuous round the margin or interrupted.—Bail. *Litho. Ferns* Ql. 53; *L. tenera*, *Dryand*; *F. v. M. Fragm.* v. 119; *L. media*, *R. Br. Prod.* 156; *L. polymorpha*, *Hook. and Grev. Ic. Filic.* t. 75.

Hab.: York Peninsula, *N. Taylor*; Rockingham Bay, *Dallachy*; Bellenden-Ker Range, *W. Hill*; Islands off the coast, *A. Cunningham, M. Gillivray*. Also in East India and the Malayan Archipelago.

5. ***L. lobata*** (lobed), *Poir.*; *Hook. and Bak. Syn. Filic.* 111; *Benth. Fl. Austr.* vii. 720. Rhizome creeping. Fronds 6 in. to 1 ft. high, simply pinnate or bipinnate with few pinnate pinnules at the base, much resembling the less-

branched specimens of *L. flabellulata*, but the fertile pinnules often more than $\frac{1}{2}$ in. broad, and the veinlets frequently anastomosing.—Bail. Litho. Ferns Ql. 52.

Hab.: Endeavour and Bloomfield Rivers, *N. Taylor*; Rockingham Bay, *Dallachy*; Hull River, *W. Hill*.

Also in East India, the Malayan Archipelago and the South Pacific Islands.

6. *L. microphylla* (small-leaved), *Swartz.*; *Hook. Spec. Filic.* i. 218; *Syn. Filic.* 110; *Benth. Fl. Austr.* vii. 720. Rhizome knotted, shortly creeping. Fronds 6 in. to 1½ ft. high, bipinnate, the main rhachis wiry but slender, usually flexuose. Primary pinnæ $\frac{1}{2}$ to 1 in. or the lower ones nearly 2 in. long. Barren pinnules varying from ovate to lanceolate, toothed or lobed; fertile ones obovate cuneate or almost fan-shaped, equilateral, 1 to 2 or rarely 3 lines broad, undivided with a continuous sorus, or notched or lobed with the sori interrupted.—*Hook. and Grev. Ic. Filic.* t. 194; *Sieb. Fl. Mixt.* n. 234; *F. v. M. Fragm.* v. 119; *Bail. Litho. Ferns*, Ql. 54.

Hab.: Brisbane River, Moreton Bay, *Fraser*; and many other southern localities.

7. *L. incisa* (cut), *Prent. in Trim. Journ. Bot.* 1873, 295; *Benth. Fl. Austr.* vii. 721. Rhizome slender, long creeping, bright-golden, clothed with hair-like bright scales. Fronds from 8 or 4 in. to 2 ft. long, pinnate. Pinnules small, the fertile ones and most of the barren ones divided to the rhachis into 2 or 3 cuneate segments 1 to 2 lines long, and usually the barren pinnules on the same rhachis as the fertile ones and below them.—*Bail. Litho. Ferns* Ql. 55.

Hab.: Near Brisbane, *Prentice*, *Bailey*; Southport, *Schneider*.

8. *L. Fraseri* (after C. Fraser), *Hook. Spec. Filic.* i. 221, t. 70, *Syn. Filic.* 112; *Benth. Fl. Austr.* vii. 721. Rhizome creeping. Fronds with a short stipes erect, simply pinnate, $\frac{3}{4}$ to 1½ ft. high. Pinnules distant, from almost ovate to lanceolate, equilateral, obtuse, truncate or cordate at the base and shortly petiolate, mostly 4 to 8 lines long, the upper ones smaller and obovate or rhomboidal, and the barren ones often larger and denticulate, the veinlets frequently anastomosing. Sori marginal, continuous or slightly interrupted.—*Bail. Litho. Ferns*, Ql. 56; *Schizoloma Fraseri*, *J. Sm.*; *Bail. Ql. Ferns*, 20.

Hab.: About the southern coastal swamps.

9. *L. ensifolia* (leaves sword-shaped), *Swartz.*; *Hook. Spec. Filic.* i. 220, *Syn. Filic.* 112; *Benth. Fl. Austr.* vii. 721. Rhizome creeping. Fronds simply pinnate, 6 to 18 in. high. Pinnules exceedingly variable in number size and shape, the barren ones at the base often small, irregularly ovate or obovate but sometimes lanceolate like the fertile ones, serrulate, rarely lobed; fertile ones in the middle sometimes only 2 or 3, sometimes nearly 20, lanceolate, 1 to 4 in. long, the frond ending in a long lanceolate lobe occasionally broken up into small obovate segments. Veins more or less anastomosing. Sori continued along the whole margin except the short equally cuneate base.—*Hook. and Grev. Ic. Filic.* t. 111; *F. v. M. Fragm.* v. 118; *Bail. Litho. Ferns*, Ql. 57; *L. lanceolata*, *Labill. Pl. Nov. Holl.* ii. 98, t. 248; *R. Br. Prod.* 156; *L. pentaphylla*, *Hook. Spec. Filic.* i. 219, t. 67; *Schizoloma ensifolium*, *J. Sm.*; *Bedd. Ferns S. Ind.* t. 25.

Hab.: Shoalwater Bay and Port Bowen, *R. Brown*; Cape York, *Daemel*; Albany Islands, *F. v. Mueller*; Daintree River, *Fitzalan*; Gilbert River, *Daintree*; Mount Wheeler, *Thozet*; Moreton Bay, *W. Hill*, *F. v. Mueller*. Common.

Also in the Mascarene Islands, East India, the Malayan Archipelago and South Pacific Islands.

Var. *heterophylla*. A few or many or all the pinnæ elongated and wholly or partially divided into small pinnules or segments.—*Bail. Litho. Fern.* Ql. 57.

Hab.: Carpentaria Islands, *R. Brown*; York Peninsula, *N. Taylor*; Cape York, *Daemel*; Rockingham Bay, *Dallachy*, *W. Hill*; Daintree River, *Fitzalan*. A common fern of the northern coastal swamp.

10. ***L. lanuginosa*** (woolly), *Wall.*; *Hook. Spec. Filic.* i. 210, t. 69, *Syn. Filic.* 109; *Benth. Fl. Austr.* vii. 722. Epiphyte, rhizome stout, creeping. Fronds 1 to about 3 ft. long, simply pinnate, the rhachis densely woolly-tomentose, or the wool at length deciduous. Pinnæ numerous, lanceolate, often falcate, $1\frac{1}{2}$ to 2½ in. long, not quite sessile, coriaceous, glabrous above, woolly-tomentose underneath at least when young, the fertile ones almost acuminate, the lower barren ones rounded at the end. Veins simple or forked, diverging from the midrib and all free. Sori continuous along the margins except the obliquely truncate base.—*F. v. M. Fragm.* v. 118; *Bail. Litho. Ferns* Ql. 56.

Hab.: Rockingham Bay, *W. Hill*; Edgcombe Bay, *Dallachy*; Port Denison and Daintree River, *Fitzalan*. Forming large masses on the branches of trees in tropical scrubs.

The pinnæ disarticulate so freely in drying that perfect specimens are seldom seen in herbaria.

Spread over tropical Asia and Africa.

20. ADIANTUM, Linn.

(From *adiantos*, dry, the fronds when plunged into water come out dry.)

Rhizome creeping or tufted. Fronds compound or rarely simple. Pinnules more or less petiolate, often oblique, the forked or dichotomous veins radiating from the petiole to the margin without any midrib. Sori marginal, short and distinct or rarely elongated and confluent. Indusium continuous with the margin and recurved bearing the spore-cases on its under surface.

A large genus, widely spread over the tropical and temperate regions of the New and the Old World.

Fronds simply pinnate. Pinnules on long petioles $\frac{1}{2}$ to 1 in. broad. Sori almost continuous

1. *A. lunulatum*.

Fronds mostly 3-pinnate. Pinnules broadly obovate, nearly equal at the base. Indusium reniform

2. *A. æthiopicum*.

Fronds bipinnate or 3-pinnate at the base. Pinnules very oblique or dimidiate. Rhizome creeping.

Pinnæ numerous. Pinnules mostly 3 to 4 lines broad. Sori and indusium transversely oblong

3. *A. formosum*.

Pinnæ fewer. Pinnules more equal, 4 to 8 lines broad

Indusium reniform

4. *A. affine*.

Indusium transversely oblong

var. *intermedium*.

Fronds with few long almost pedate glabrous pinnæ. Pinnules membranous, finely veined. Sori in the sinus, reniform. Rhizome tufted

5. *A. diaphanum*.

Fronds more pedate, more or less hispid. Pinnules prominently veined.

Sori rounded, contiguous. Rhizome usually tufted

6. *A. hispidulum*.

1. ***A. lunulatum*** (crescent-shaped), *Burm.*; *Hook. Spec. Filic.* ii. 11, *Syn. Filic.* 114; *Benth. Fl. Austr.* vii. 723. Rhizome short. Fronds tufted simply pinnate, 6 in. to near 1 ft. long, the rhachis wiry, very slender. Pinnules articulate on slender petioles of 1 to 4 lines, obliquely fan-shaped, $\frac{1}{2}$ to 1 in. broad. Sori elongated, sometimes continuous along the whole outer margin, but often more or less interrupted.—*Hook. and Grev. Ic. Filic.* t. 104; *Bail. Litho. Ferns* Ql. 58.

Hab.: Rockingham Bay, Endeavour River, and a few other tropical localities but not common.

Spread over the the tropical regions of the New and the Old World.

2. ***A. æthiopicum*** (*Æthiopian*), *Linn.*; *Hook. Spec. Filic.* ii. 87, t. 77, *Syn. Filic.* 123; *Benth. Fl. Austr.* vii. 724. Rhizome tufted or stoloniferous. Fronds usually 1 to 1½ ft. high, 4 to 8 in. broad, twice three or four times pinnate, the rhachis slender shining, often flexuose. Pinnules on short petioles, mostly obovate-orbicular with a more or less cuneate equal base, 3 to over 5 lines broad, thin and bright green, broadly crenate or very shortly lobed. Sori distinct in the sinus of the crenatures, the reflexed indusium reniform or at length transversely oblong.—*Bedd. Ferns S. Ind.* t. 5; *Hook. f. Fl. Tasm.* ii. 187; *F. v. M. Fragm.*

v. 119; Sieb. Fl. Mixt. n. 244; Bail. Litho. Ferns Ql. 59; *A. assimile*, Swartz; Hook. Spec. Filic. ii. 87; R. Br. Prod. 155; *A. trigonum*, Labill. Pl. Nov. Holl. ii. 99, t. 248.

Hab.: Common in most localities.

Of this variable and widely spread species, there appear to be two rather distinct forms, one having a brown stipes and the other a black stipes; the latter is also of a more erect growth.

3. ***A. formosum*** (handsome), R. Br. Prod. 155; Benth. Fl. Austr. vii. 724. Rhizome creeping, scaly. Fronds 1 to 8 ft. high, broadly spreading, 2 to 4 times pinnate, the stipes often scabrous with numerous pinnæ, the primary and secondary ones always simply pinnate at the end, the main rhachis usually flexuose slender and black. Pinnules membranous or scarcely coriaceous, shortly petiolate, obliquely oblong obovate or rhomboidal, usually 3 to 4 lines rarely only 2 lines long, or larger when barren, the entire sides very unequal, the fruiting margin crenate-toothed. Sori on the teeth or between them. Indusium transversely oblong or somewhat reniform.—Hook. Spec. Filic. ii. 51, t. 86, Syn. Filic. 119; F. v. M. Fragm. v. 120; Bail. Litho. Ferns Ql. 60.

Hab.: Port Denison, Fitzalan; Moreton Bay, Leichhardt and others; Ipswich, Nernst. A common scrub species.

Also in New Zealand.

4. ***A. affine*** (allied to another), Willd.; Hook. and Bak. Syn. Fil. 117; Benth. Fl. Austr. vii. 724. Near *A. formosum*, but much less divided, with larger pinnules more equal in size. Rhizome creeping. Fronds 1 ft. high or more, bipinnate or tripinnate only in the lower part. Primary pinnæ not numerous, 3 to 6 in. long, pinnules almost sessile, very obliquely ovate or oblong-rhomboidal, 4 to 8 lines broad, the outer margins dentate. Sori marginal, scarcely indented. Indusium broadly reniform.—F. v. M. Fragm. v. 119; Bail. Litho. Ferns Ql. 61; *A. Cunninghamii*, Hook. Spec. Filic. ii. 52, t. 86.

Hab.: Maroochie and other localities along the North Coast Railway.

Also in New Zealand.

Var. *intermedium*. Fronds and pinnules of *A. affine*, but the indusia transversely oblong as in *A. formosum*.

Hab.: Rockingham Bay, Dallachy.

5. ***A. diaphanum*** (nearly transparent), Blume; Hook. Spec. Filic. ii. 10, t. 80, Syn. Filic. 117; Benth. Fl. Austr. vii. 725. A much smaller and more delicate plant than *A. affine*. Rhizome tufted. Fronds 6 in. to 1 ft. high including the slender stipes, with 2 to 5 primary pinnæ 3 to 6 in. long, the lower ones sometimes with 1 or 2 secondary ones at the base. Pinnules numerous, very shortly petiolate, obliquely ovate-rhomboidal with very unequal bases, thinly membranous, 3 to 6 lines broad, the outer margin dentate. Sori in the sinus of the teeth. Indusium deeply reniform.—Bail. Litho. Ferns Ql. 62; *A. affine*, Hook. Spec. Filic. ii. 82, not of Willd.

Hab.: In dense damp shady scrubs throughout Queensland.

Also in the Malayan Archipelago, South China, the South Pacific Islands and New Zealand.

6. ***A. hispidulum*** (minutely hispid), Swartz; Hook. Spec. Filic. ii. 81, Syn. Filic. 126; Benth. Fl. Austr. vii. 725. Rhizome tufted or rarely creeping. Fronds when perfect once or twice forked at the base, each branch ending in a long pinna or pinnately divided at the base or higher up into secondary pinnæ. Pinnules numerous, very shortly petiolate, obliquely ovate-rhomboid, 3 to 8 lines long or broad, rather rigid, prominently veined, the under surface as well as the rhachis more or less hispid. Sori usually almost contiguous though not confluent. Indusia much recurved, orbicular slightly reniform.—Bedd. Ferns S. Ind. t. 3; F. v. M. Fragm. v. 120; Bail. Litho. Ferns Ql. 63.

Hab.: Common in all scrubs.

Extends over tropical Asia and Africa, the Pacific Islands and New Zealand.

Of this species there are two forms.

21. HYPOLEPIS, Bernh.

(From *hypo*, under, and *lepis*, a scale.)

Rhizome creeping. Fronds compound, usually large, the pinnules penniveined. Sori marginal, short, in the sinus of the teeth of the pinnules. Indusium a small scale continuous with the margin, recurved over the sorus, the spore-cases attached at its base.

The genus comprises but few species dispersed over the tropical and subtropical regions of the New and the Old World.

1. *H. tenuifolia* (slender-leaved), Bernh. ; Hook. Spec. Filic. ii. 60, t. 89, 90, Syn. Filic. 129 ; Benth. Fl. Austr. vii. 726. Fronds 4 to 5 ft. high including the stipes and often above 1 ft. broad, 8 or 4 times pinnate. Tertiary pinnæ lanceolate, deeply pinnatifid or pinnate ; fruiting pinnules or segments 2 to 4 lines long, crenate-toothed. Rhachis and under side of the segments usually slightly hairy. Sori few or several to each segment in the sinus of the teeth, the reflexed scale-like indusium at first often covering the sorus but in an advanced stage almost concealed under the sorus or quite withered away.—Bail. Litho. Ferns. Ql. 64.

Hab.: In the dense scrub North and South, but most abundant in the tropics. Also in the Malayan Archipelago, the South Pacific Islands and New Zealand.

22. CHEILANTHES, Swartz.

(From *cheilos*, lip, and *anthos*, flower.)

Rhizome tufted or creeping. Fronds usually small, twice or thrice pinnate with small lobed segments. Sori globular and distinct at the end of the veinlets or oblong by the confluence of 2 or more, all marginal, the slightly altered teeth or lobes bent over them and forming an indusium with the spore-cases inserted at their base as in *Pteris*. Veinlets forked from a central nerve.

A considerable genus widely spread over the tropical and temperate regions of the New and the Old World.

Ultimate lobes of the fronds obovate or oblong 1 to 2 lines long, or rarely

ovate-lanceolate and larger 1. *C. tenuifolia*.
Pinnules ending in a linear lobe usually about $\frac{1}{2}$ in. long 2. *C. caudata*.
(See also NOTHOLÆNA, where the margin forms a spurious indusium.)

1. *C. tenuifolia* (slender-leaved), Swartz. ; Hook. Spec. Filic. ii. 82, t. 87, Syn. Filic. 138 ; Benth. Fl. Austr. vii. 726. Curly fern. Rhizome horizontal or shortly creeping often knotty. Fronds from 2 or 3 in. to 1 ft. high, from narrow-lanceolate to broadly ovate-triangular in outline, the stipes and main rhachis glabrous or scaly-hairy. Primary pinnæ nearly opposite in distinct pairs, exceedingly variable in form and division, from under $\frac{1}{2}$ in. long with few entire ovate segments, to above 2 in. long and broad, elegantly pinnate a second and a third time, the tertiary pinnules deeply pinnatifid, the ultimate segments in all cases ovate or oblong obtuse 1 to 2 lines long, with every intermediate between these extremes, or rarely the primary segments ovate-lanceolate obtuse $\frac{1}{2}$ in. long and scarcely lobed, the whole pinnæ quite flat or with a very crisped aspect from the recurved or revolute margins. Sori usually numerous round the margins, nearly contiguous, with the small rounded teeth or lobes bent over them.—R. Br. Prod. 155 ; Sieb. Filic. Exs. 116, Fl. Mixt. n. 250 ; Kunze in Pl. Preiss. ii. 111 ; Hook. f. Fl. Tasm. ii. 188 ; F. v. M. Fragm. v. 122 ; Bedd. Ferns S. Ind. t. 188 ; Bail. Litho. Ferns Ql. 65.

Var. *Sieberi*. Rhizome short almost erect. Fronds tufted, erect, oblong in outline, from a few to 18 in. high, and 1 to 3 in. broad. Sori punctiform often very dark. The most common form in southern Queensland but also in the North.—Bail. Litho. Ferns. Ql. 66, *C. Sieberi*, Kunze in Pl. Preiss. ii. 112 ; Hook. Spec. Filic. ii. 83, t. 97 ; *C. Preissiana*, Kunze, l.c.

Var. *nudiuscula*. Rhizome short. Fronds tufted, texture coriaceous, densely pubescent. Sori usually brown. A tropical form.—Bail. Litho. Ferns. Ql. 65 ; *Pteris nudiuscula*, R. Br. Prod. 155 ; *Pellaea nudiuscula*, Hook. Spec. Filic. ii. 151,

2. C. caudata (tailed), *R. Br. Prod.* 156; *Benth. Fl. Austr.* vii. 727. Perhaps a variety of *C. tenuifolia*, but has a very different aspect. Fronds 6 to 8 in. long, slender, bipinnate at least at the base, the pinnæ not numerous, all whether primary or secondary ending in a narrow-linear pinnule, usually at least $\frac{1}{2}$ in. long, continuous or interrupted at the base, and soriferous throughout, the few segments at the base of the pinnæ shortly linear.

Hab.: Endeavour River, Banks and Solander; Port Bowen, R. Brown; Gilbert River, Daintree.

28. PTERIS, Linn.

(From *pterys*, a wing, or *pteron*, a feather, from the feather-like fronds of some species).

Rhizome short and thick or creeping. Fronds usually large and compound rarely small or simple. Veins simple forked or reticulate, with or without a midrib. Sori linear, continuous or slightly interrupted along the margin of the segments, with a continuous narrow membranous indusium proceeding from the margin and opening along the inner or lower edge. Spore-cases inserted on the frond under the indusium.

A large genus distributed over the temperate as well as the tropical regions of the globe.

Veins oblique on the midrib, forked and free, but almost concealed in the thick substance of the frond.

Fronds 2 to 4 in. long and broad, 3-partite with deeply pinnatifid divisions 1. *P. geraniifolia*.

Fronds 6 to 18 in. long, simply pinnate with distinct not decurrent undivided pinnules.

Rhachis usually glabrous. Pinnules broad, $1\frac{1}{2}$ to $2\frac{1}{2}$ in. long, shortly petiolate. 2. *P. paradoxa*.

Rhachis scaly-hirsute. 3. *P. falcata*.

Pinnules lanceolate, 1 to 2 in. long, sessile 4. *P. rotundifolia*.

Pinnules orbicular or broadly oblong, very obtuse, $\frac{1}{2}$ to $\frac{3}{4}$ in long

Veins transverse on the midrib, simple or forked, free, apparent on the membranous frond.

Fronds pinnate. 5. *P. longifolia*.

Pinnæ numerous, narrow, undivided, 3 to 6 in. long 6. *P. ensiformis*.

Pinnæ few, narrow, 2 to 4 in. long, undivided or with few short lateral lobes; barren pinnules short and broad 7. *P. umbrosa*.

Pinnæ many, narrow, 4 to 6 in. long, some undivided others with few lobes 8. *P. quadriaurita*.

Pinnæ 4 to 8 in. long, deeply pinnatifid with numerous narrow segments 9. *P. tremula*.

Fronds large, 2 to 4 times pinnate, segments decurrent. 10. *P. aquilina*, var.

Segments glabrous narrow, rather regular. Indusium not thickened at the base 11. *P. incisa*.

Segments often very unequal, usually hairy underneath between the raised midrib and the sorus. Indusium from a thickened base 12. *P. marginata*.

Veins from an irregular midrib oblique branched occasionally anastomosing. Frond large compound. 13. *P. comans*.

Veins copiously reticulate on each side of the midrib. Frond-branches pinnate. Pinnæ deeply pinnatifid.

Fronds 3-partite. Segments of the pinnæ connected by a uniform winged rhachis 2 to 3 lines broad

Frond with several branches. Segments of the pinnæ decurrent on the rhachis

1. P. geraniifolia (Geranium-leaved), *Raddi, Filic. Bras.* 46; *Benth. Fl. Austr.* vii. 728. Rhizome tufted. Fronds broadly rounded-cordate in outline, 2 to 4 in. long and broad, coriaceous, tripartite, the lateral divisions divaricate, all deeply pinnatifid, the lower segments again pinnatifid, the upper ones short and entire; lobes all obtusely lanceolate or ovate, with a black midrib sometimes shortly conspicuous, the veins otherwise oblique and forked concealed in the substance of the frond. Sori continuous on the lobes.—Bedd. Ferns 8. Ind. t.

87; F. v. M. Fragm. v. 124; Bail. Litho. Ferns Ql. 68; *P. pedata*, R. Br. Prod. 155, not of Linn.; *P. Brownii*, Desv. in Mem. Soc. Linn. Par. vi. 294; *Pellaea geraniifolia*, Fée; Hook. Ic. Pl. t. 915, Spec. Filic. ii. 132, Syn. Filic. 146.

Hab.: Broadsound, *R. Brown*; Rockingham Bay, *Dallachy*; Port Denison, *Fitzalan*; Rockhampton, *O'Shanesy*, *Bowman*; Bowen, *Woolfs*; Brisbane River, *Bailey*.

Widely dispersed over the tropical and subtropical regions of the New and the Old World.

2. ***P. paradoxa*** (paradoxical), *Baker*; *Benth. Fl. Austr.* vii. 729. Rhizome creeping. Fronds 6in. to 1½ft. high, simply pinnate, the rhachis dark and shining, glabrous or very rarely with a few scales. Pinnæ very few on young plants, often above 20 on luxuriant fronds, usually petiolate, lanceolate or ovate-lanceolate, 1½ to 2½in. long and usually broader than in *P. falcata*, coriaceous with dichotomous free veins oblique on the midrib concealed in the substance of the frond. On young plants the fronds often simple bearing a solitary ovate-cordate pinna. Sori usually continuous all round very nearly to the petiole. Indusium not so thin as in most species, soon concealed under the sori.—Bail. Litho. Ferns Ql. 70; *Adiantum paradoxum*, R. Br. Prod. 155; Sieb. Fl. Mixt. n. 269; *Pellaea paradoxa*, Hook. Spec. Filic. ii. 135, t. 111, Syn. Filic. 152; *Platyloma Brownii*, J. Sm.; Bail. Queensl. Ferns, 86.

Hab.: Brisbane River, Moreton Bay, *A. Cunningham*, *F. v. Mueller* and others; Port Denison, *Fitzalan*.

3. ***P. falcata*** (sickle-shaped), *R. Br. Prod.* 154; *Benth. Fl. Austr.* vii. 729. Ear fern. Rhizome creeping. Fronds 6in. to 1½ft. long, simply pinnate, the rhachis densely scaly-hirsute. Pinnæ numerous, sessile or nearly so, lanceolate, often falcate, 1 to 2in. long, acute or rather obtuse, coriaceous with the concealed venation of *P. paradoxa*, the lower ones rarely auriculate at the base on the upper side. Sori continuous all round except the truncate base.—Hook. f. Fl. Tasm. ii. 139; Sieb. Syn. Filic. n. 109, Fl. Mixt. n. 253; F. v. m. Fragm. v. 123, partly; Bail. Litho. Ferns Ql. 69; *Pellaea falcata*, Fée; Hook. Spec. Filic. ii. 135, t. 111, Syn. Filic. 151; *P. seticaulis*, Hook. Ic. Pl. t. 207; *Platyloma falcatum*, J. Sm.; Bedd. Ferns S. Ind. t. 22.

Hab.: Brisbane River, Moreton Bay, *A. Cunningham*; Port Denison, *Fitzalan*; Rockhampton and neighbouring districts, *Bowman*, *O'Shanesy* and others.

Also in East India, the Malayan Archipelago and New Zealand.

Var. *nana*. Rhizome very short. Fronds tufted. The pinnæ crowded almost overlapping, ½ to ¾in. long.—Bail. Litho. Ferns, Ql. 69.

Hab.: Very common in southern scrubs.

4. ***P. rotundifolia*** (round-leaved), *Forst.*; *Hook. Ic. Pl.* t. 422; *Benth. Fl. Austr.* vii. 730. Habit of *P. falcata* but usually smaller or more slender. Pinnæ orbicular or very broadly oblong, obtuse, often slightly cordate at the base, almost sessile, usually about ¾in. long or when luxuriant 1in. Venation and scaly hirsute rhachis entirely as in *P. falcata*.—Bail. Litho. Ferns Ql. 71; *Pellaea rotundifolia*, Hook. Spec. Filic. ii. 136, Syn. Filic. 151; *Platyloma rotundifolium*, J. Sm.; Bail. Queensl. Ferns, 86.

Hab.: Mount Dryander, *Fitzalan*, also Mount Lindsay, *Hill*.

Also in New Zealand and in Norfolk Island. The figure in Hooker's Filic. Exot. t. 48, represents a luxuriant large form probably from a cultivated specimen. —*Benth.*

5. ***P. longifolia*** (long-leaved), *Linn.*; *Hook. Spec. Filic.* ii. 157, *Syn. Filic.* 153; *Benth. Fl. Austr.* vii. 730. Rhizome short and thick. Fronds 1 to 2ft. high, simply pinnate, the stipes scaly-hairy at the base only. Pinnæ usually numerous, sessile or nearly so, linear or linear-lanceolate, 3 to 6in. long in full-grown specimens, the simple or forked veins transverse from the midrib and

apparent. Sori continuous along the whole margin except the small rounded or cordate base.—F. v. M. *Fragm.* v. 126; *Bedd. Ferns S. Ind.* t. 83; *Bail. Litho. Ferns Ql.* 72.

Hab.: Brisbane River, Moreton Bay, Main Range, Rockhampton and Mount Perry.

Widely spread over the tropical and temperate regions of the globe.

6. ***P. ensiformis*** (sword-shaped), *Burm. Fl. Ind.* 280, *Thes. Zeyl.* t. 87; *Benth. Fl. Austr.* vii. 780. Rhizome creeping. Fronds 9 to 16in. high, pinnate, the stipes without scales. Pinnæ when fertile usually linear, entire or the lower ones or nearly all lobed or again pinnate at the base, the terminal lobe often 2 to 4in. long, the lateral ones short, often shortly decurrent; lobes of the barren fronds or pinnæ oblong or ovate and denticulate; veins forked, transverse from the midrib. Sori continuous round the fertile lobes.—Hook. and Bak. *Syn. Filic.* 155; *Bail. Litho. Ferns Ql.* 78; *P. crenata*, Swartz; Hook. *Spec. Filic.* ii. 168, t. 127; *R. Br. Prod.* 154; *F. v. M. Fragm.* v. 125.

Hab.: Endeavour River, *Banks and Solander*; York Peninsula, *N. Taylor*; Port Denison, *Fitzalan*. Very common in northern localities.

Ranges over tropical and Eastern Asia and the Pacific Islands.

7. ***P. umbrosa*** (shade-loving), *R. Br. Prod.* 154; *Benth. Fl. Austr.* vii. 780. Rhizome thick and knotted or shortly creeping. Fronds attaining 2 or 8ft., pinnate, the stipes often slightly scabrous. Pinnæ 13 to 21, linear-lanceolate, 4 to 6in. long, entire or the lower ones again divided into 8 to 5 similar segments, all more or less decurrent on the rachis, usually broader and minutely serrulate when barren, and the barren ends of fertile ones often deeply serrate; veinlets transverse, mostly forked. Sori continued down the decurrent base.—Hook. *Spec. Filic.* ii. 162, t. 130, *Syn. Filic.* 155; *F. v. M. Fragm.* v. 126; *Sieb. Syn. Filic.* n. 128; *Bail. Litho. Ferns Ql.* 74.

Hab.: Brisbane River, Moreton Bay. Common on ranges.

8. ***P. quadriaurita*** (4-eared), *Retz.*; *Hook. Spec. Filic.* ii. 179, t. 184, *Syn. Filic.* 158; *Benth. Fl. Austr.* vii. 781.—Rhizome thick. Fronds pinnate, varying from 1 to 8ft. long. Pinnæ mostly opposite, 4 to 8in. long, regularly and deeply pinnatifid, otherwise undivided or the lower ones with one or two similar secondary pinnæ on the lower side. Pinnules or segments numerous, broadly linear, often falcate, obtuse, 4 to 8 lines long, confluent at the base, the pinnæ usually ending in a long, linear-lanceolate point lobed at the base. Sori often not reaching the base of the segments.—*Bedd. Ferns S. Ind.* t. 81; *F. v. M. Fragm.* v. 125; *Bail. Litho. Ferns Ql.* 75.

Hab.: Cape York Peninsula, *Hann's Expedition*, *N. Taylor*; Rockingham Bay, *W. H. Dallachy*; Daintree River, *Fitzalan*, and other tropical localities.

Widely spread over the tropical regions of the New and the Old World.

9. ***P. tremula*** (trembling), *R. Br. Prod.* 154; *Benth. Fl. Austr.* vii. 781. Rhizome suberect. Fronds 1 to 5ft. (usually 2 to 4) high, glabrous, twice to four times pinnate, not so broadly expanded and the divisions more regular than in *P. aquilina*, the pinnæ mostly opposite. Ultimate segments linear, rather firm when in fruit, $\frac{1}{4}$ to 1in. long, slightly decurrent, membranous flat and serrulate when barren; veins mostly forked and transverse. Sori usually continuous but scarcely reaching the base of the segments and sometimes interrupted, at length expanded so as to conceal the indusium.—Hook. *Spec. Filic.* ii. 174, t. 120; *Syn. Filic.* 161; Hook. *f. Fl. Tasm.* ii. 140; *Sieb. Syn. Filic.* n. 130; *Bail. Litho. Ferns Ql.* 76.

Hab.: Common in scrubs North and South.

Also in Norfolk and Fiji Islands and New Zealand.

10. ***P. aquilina*** (eagle-like) *Linn.*; *var. esculenta*; *Hook. Spec. Filic.* ii. 197. *Syn. Filic.* 168; *Benth. Fl. Austr.* vii. 781. The Esculent Bracken. Rhizome thick and creeping. Fronds from 1 or 2 to 8 or 10ft. high, usually thrice pinnate. Primary pinnæ distant, the lowest pair much larger and more compound, the upper gradually decreasing, giving the whole frond a triangular outline 2 to 4ft. broad. Secondary or tertiary pinnæ numerous, lanceolate, deeply pinnatifid or pinnate, always ending in a linear undivided obtuse segment, the lateral segments oblong or linear, scarcely widened at the base but decurrent on the rhachis, the midrib usually raised dilated and hardened with acute ciliate edges and the under surface usually hairy between the midrib and the sori. Sori continuous along the margin, the rather broad indusium really marginal, but the frond thickened and often minutely crenulate at the base of the indusium make it appear intramarginal.—*Kunze in Pl. Preiss.* ii. 111; *Hook. f. Fl. Tasm.* ii. 189; *F. v. M. Fragm.* v. 126; *Sieb. Syn. Filic.* n. 127; *Bail. Litho. Ferns Ql.* 77.; *P. esculenta*, *Forst.*; *Labill. Pl. Nov., Holl.* ii. 95, t. 244; *R. Br. Prod.* 154.

Hab.: Very abundant both North and South.

Var. lanuginosa, *Hook.*, *Spec. Filic.* ii. 196. The Woolly Bracken. A tall strong plant, very hard, but, from being closely covered with soft woolly down, has a somewhat soft appearance, and grows in intricate masses 5 or 6ft. high.—*Bail. Litho. Ferns, Ql.* 78.

Hab.: Bellenden-Ker, at between 2,000 and 5,000ft. above sea-level, forming large patches most difficult to pass through.

The species is generally abundant in some form or other in most tropical and temperate regions of the globe.

11. ***P. incisa*** (cut), *Thunb.*; *Hook. Spec. Filic.* ii. 280, *Syn. Filic.* 172; *Benth. Fl. Austr.* vii. 782. Bat's-wing Fern. Rhizome creeping. Fronds varying from 1 to 5ft. high, glabrous, twice or thrice pinnate. Pinnules of the barren fronds usually deeply pinnatifid, 1 to 2in. long, with broad obtuse membranous lobes, the veins proceeding from the midrib of the pinnule repeatedly forked in each lobe, the branches here and there anastomosing or all free. In the fertile fronds the secondary pinnæ often pinnate at the base, pinnatifid in the upper part, the lower pinnules or segments with a distinct midrib and variously branched veins, the upper lobes less regularly veined. Sori continuous or interrupted, often neither reaching the base nor the apex of the segment.—*Hook. f. Fl. Tasm.* ii. 140; *Sieb. Fl. Mixt.* n. 252; *F. v. M. Fragm.* v. 124; *P. vespertilionis*, *Labill. Pl. Nov. Holl.* ii. 96, t. 245; *R. Br. Prod.* 154; *Bail. Litho. Ferns, Ql.* 79; *Litobrochia vespertilionis*, *Presl*; *Bail. Ql. Ferns*, 26.

Hab.: In many southern localities.

Spread over the tropical and southern extratropical regions of the New and the Old World.

12. ***P. marginata*** (bordered), *Bory*; *Hook. and Bak. Syn. Filic.* 172; *Benth. Fl. Austr.* vii. 788. Rhizome short, stout. Fronds when full grown several feet high, the main rhachis branched, usually tripartite, each branch pinnate. Pinnæ numerous, 3 to 10in. long, deeply pinnatifid; segments oblong or broadly linear, often falcate, obtuse, $\frac{1}{4}$ to 1in. long, confluent into a winged rhachis 2 to 3 lines broad; veins copiously reticulate on each side of the midrib. Sori often continued round the sinus, but rarely reaching the ends of the lobes. Barren fronds thinner, the lobes often minutely dentate.—*Bail. Litho. Ferns Ql.* 80; *P. tripartita*, *Swartz*; *Hook. Spec. Filic.* ii. 225, t. 188; *F. v. M. Fragm.* v. 125; *P. Milneana*, *Baker, Syn. Filic.* 170; *Litobrochia tripartita*, *Presl.* and *L. Milneana*, *Bail. Queensl. Ferns*, 26.

Hab.: Rockingham Bay, *Dallachy*; Bellenden-Ker Range, *W. Hill*; Daintree River, *Fitzalan*; Bowen, *Woolls*. In most tropical scrubs.

Ranges over tropical Asia and Africa and the Pacific Islands.

18. *P. comans* (bushy), *Forst.*; *Hook. Spec. Filic.* ii. 219, *Syn. Filic.* 171; *Benth. Fl. Austr.* vii. 788. Near *P. marginata*, but larger and more branched, the main rhachis bearing several branches or primary pinnæ of 1 to 2ft. or more. Secondary pinnæ 4 to 10in. long, deeply pinnatifid; segments numerous, $\frac{1}{4}$ to 2in. long, oblong-lanceolate or linear, often falcate, decurrent along the rhachis which is not, however, uniformly winged as in *P. marginata*; some of the lower segments sometimes again shortly pinnatifid; veins copiously reticulate. Sori usually continued round the sinus but rarely to the tips of the lobes. Barren segments or barren tips of the fertile ones usually dentate.—*F. v. M. Fragm.* v. 125; *Bail. Litho. Ferns* Ql. 81; *P. Endlicheriana*, *Agardh*; *Hook. Ic. Pl.* t. 978, *Spec. Filic.* ii. 218; *Hook. f. Fl. Tasm.* ii. 141; *P. microptera*, *Metten.*; *Kuhn in Linnæa*, xxxvi. 92.

Hab.: Southern localities.

Also in New Zealand and the Pacific Islands.

24. LOMARIA, Willd.

(From *loma*, a fringe or border; referring to the indusium.)

(*Stegania*, *R. Br.*)

Rhizome creeping or ascending into a short trunk. Fronds pinnatifid or simply pinnate, rarely undivided, the outer ones of each year's shoot barren with flat pinnules, the inner ones with linear fertile pinnules or rarely a few lower barren ones. Sori in a continuous line on each side of the midrib between it and the margin, with a membranous indusium attached close to the margin and opening on the inner side next the midrib, the sori at length covering almost the whole of the under surface. Veins of the barren pinnules transverse or oblique on the midrib, mostly forked.

The genus is generally distributed over the tropical and temperate regions of the globe.

Fronds simple or with few long segments decurrent on the stipes 1. *L. Patersoni*.

Barren fronds with numerous segments attached to the rhachis by a broad base, the upper ones confluent.

Lowest segments as long as the others or nearly so 2. *L. vulcanica*.

Lower segments gradually smaller and more distant.

Rhachis and stipes glabrous except at the very base.

Barren segments narrow, 1 to 4in. long, fertile ones nearly as long.

Rhachis dark

3. *L. discolor*.

Barren segments broadly lanceolate, 1 to 1½in. long; fertile ones $\frac{1}{2}$ to 1in. Rhachis pale

4. *L. lanceolata*.

Barren fronds with several or numerous pinnæ attached by the midrib only, the lowest rarely small.

Segments obliquely truncate at the base 5. *L. capensis*.

Segments tapering at the base 6. *L. euphlebia*.

1. *L. Patersoni* (after — *Paterson*), *Spreng.*; *Hook. Spec. Filic.* iii. 8, *Syn. Filic.* 174; *Benth. Fl. Austr.* vii. 781. Rhizome short and thick. Fronds from under 1ft. to near 2ft. long, undivided or pinnatifid with few (very rarely 9 or 11) linear segments of 8 to 6in., more or less decurrent on the rhachis and short stipes, those of the barren fronds $\frac{1}{2}$ to 1in. broad, the veins transverse; segments of the fertile fronds as long but only 1 to 2 lines broad, the sori at length covering the whole under surface. Occasionally the lower portion of the frond broad and barren and the upper segments wholly or partially narrow and fertile.—*Hook. Filic. Exot.* t. 49; *Hook. f. Fl. Tasm.* ii. 141; *F. v. M. Fragm.* v. 122; *Bail. Litho. Ferns* Ql. 82 (simple fronds); *Stegania Patersoni*, *R. Br. Prod.* 152; *Lomaria elongata*, *Blume*; *Hook. Spec. Filic.* iii. 8, t. 143.

Hab.: Rookingham Bay, *Dallachy*; Mount Lindsay, *W. Hill*; Tallebudgera, *Schneider*; and many other southern localities.

Dispersed over East India, the Malayan Archipelago, the south Pacific Islands and New Zealand. In all the Queensland localities there are plants with undivided and with pinnatifid fronds, and sometimes the two from the same rhizome.—*Benth.*

2. ***L. vulcanica*** (first found near volcanoes), *Blume*; *Hook. Spec. Filic.* iii. 12, *Ic. Pl. t.* 969, *Syn. Filic.* 176; *Benth. Fl. Austr.* vii. 785. Rhizome thick or shortly creeping, covered with shining black hair-like scales. Fronds under 1ft. high, glabrous, deeply pinnatifid with numerous segments; those of the barren fronds lanceolate, falcate, confluent by their broad base, the lower ones 1 to 2in. long, 3 to 6 lines broad, the lowest pair scarcely smaller and sometimes reflexed, the upper segments gradually diminished to short lobes. Segments of the fertile fronds nearly as long, under 2 lines broad except the dilated adnate base.—*Hook. f. Fl. Tasm.* ii. 148.

Hab.: A specimen with barren fronds only from York Peninsula, *N. Taylor*, appears to be this plant.—*Benth.*

Also in New Zealand, Java and the South Pacific Islands.

8. ***L. discolor*** (2-colored), *Willd.*; *Hook. Spec. Filic.* iii. 5, *Syn. Filic.* 175; *Benth. Fl. Austr.* vii. 785. Rhizome thick, ascending into a trunk of 1ft. or more. Fronds 1 to 2ft. or sometimes longer, pinnate or deeply pinnatifid, the rachis and stipes glabrous and shining black, with scales only at the base of the stipes. Larger pinnules of the barren fronds $1\frac{1}{2}$ to 3 or even 4in. long, broadly linear, or narrow-lanceolate, mostly connected by their dilated base, usually of a thicker texture, and the veins less conspicuous than in *L. lanceolata*, the lower ones gradually smaller and more distinct. Pinnules of the fertile fronds very numerous, 1 to 4in. long, $1\frac{1}{2}$ to 2 lines broad.—*Hook. f. Fl. Tasm.* ii. 148; *F. v. M. Fragm.* v. 121; *Sieb. Fl. Mixt.* n. 245; *Bail. Litho. Ferns Ql.* 83 and 84; *Stegania nuda* and *S. falcata*, *R. Br. Prod.* 158; *Onoclea nuda*, *Labill. Pl. Nov. Holl.* ii. 96, t. 246.

Hab.: Rockingham Bay, *Dallachy*; Maroochie, *Bailey*; Tallebudgera, *Schneider*.

Also in New Zealand and Norfolk Island.

4. ***L. lanceolata*** (lance-like), *Spreng.*; *Hook. Spec. Filic.* iii. 11, *Ic. Pl. t.* 429, *Syn. Filic.* 177; *Benth. Fl. Austr.* vii. 785. Rhizome thick, sometimes rising into a trunk of $\frac{1}{2}$ ft. or more. Fronds 6in. to above 1ft. long, deeply pinnatifid or pinnate, the rachis glabrous, usually pale-coloured or green. Segments of the barren fronds oblong or lanceolate, dilated at the base, contiguous and often confluent, the longer ones $\frac{3}{4}$ to near 2in. long and 4 to 6 lines broad, the lower gradually smaller, the lowest very short and broad. Segments of the fertile fronds under 1in. long, about $1\frac{1}{2}$ line broad.—*Hook. f. Fl. Tasm.* ii. 148; *F. v. M. Fragm.* v. 121; *Bail. Litho. Ferns Ql.* 85; *Stegania lanceolata*, *R. Br. Prod.* 152.

Hab.: Johnstone River, *W. R. Kefford*. These specimens were imperfect but seemed rather to belong to this than any other species.

Also in New Zealand and the Pacific Islands.

5. ***L. capensis*** (of Cape of Good Hope), *Willd.*; *F. v. M. Fragm.* v. 121; *Benth. Fl. Austr.* vii. 787. Red-cabbage Fern. Rhizome thick and scaly, short or ascending to a short trunk. Fronds pinnate, the segments of the barren ones broadly lanceolate, very oblique at the base and attached only by the midrib, the lowest pairs not much smaller or very rarely one small pair lower down, otherwise very variable, the frond sometimes 3 to 4ft. long with numerous rigid pinnæ 3 to 6in. long and 1in. broad, and from that to a whole frond of 6in. with membranous pinnæ of $\frac{1}{2}$ to 1in., the rachis slightly scaly or glabrous. Fertile fronds equally variable, the narrow linear pinnæ in some specimens under 1in. in others above 6in. long.—*L. procera*, *Spreng.*; *Hook. Spec. Filic.* iii. 22, *Syn. Filic.* 179, *Ic. Pl. t.* 427, *Gard. Ferns t.* 58; *Hook. f. Fl. Tasm.* ii. 142; *Bail. Litho. Ferns Ql.* 86; *Blechnum procerum*, *Labill. Pl. Nov. Holl.* ii. 97, t. 247; *Stegania minor* and *S. procera*, *R. Br. Prod.* 158.

Hab.: Rockingham Bay, *Dallachy*; Mount Lindsay, *W. Hill*; Bowen, *Woolfs*. Common in southern localities.

The species is dispersed over tropical and southern extratropical America, the Malayan Archipelago, the south Pacific Islands and New Zealand.

6. **L. euphlebia** (well-veined), Kunze; Hook. Spec. Filic. iii. 89, *Syn. Filic.* 188; Benth. *Fl. Austr.* vii. 788. Rhizome thick and woody, slightly scaly, ascending to 1 ft. or more. Fronds pinnate, often above 2 ft. long. Pinnae distant, lanceolate, 3 to 6 in. long, $\frac{1}{2}$ to $\frac{3}{4}$ in. broad, contracted at the base and sometimes tapering to a short petiole, the uppermost one rarely sessile or slightly decurrent, the lowest not much smaller, the rachis glabrous. Pinnae of the fertile fronds narrow-linear, 3 to 6 in. long.—*L. articulata*, F. v. M. *Fragm.* v. 187; Bail. *Litho. Ferns* Ql. 87.

Hab.: Rockingham Bay, *Dallachy*.

Spread over East India, China and Japan.

Hooker's figure 2nd Cent. Ferns, t. 89, represents an abnormal Japanese and Chinese variety with the pinnae from the middle upwards adnate by a broad base.—Benth.

25. BLECHNUM, Linn.

(From *blechnon*, the Greek name of a fern.)

Rhizome short and thick or slightly elongated and horizontal. Fronds deeply pinnatifid or pinnate, the segments narrow. Sori in a continuous line on each side of the midrib, with a membranous indusium opening from under the midrib outwards, the two sori often at length confluent concealing the midrib.

The genus consists of but few species dispersed over the tropical and sub-tropical regions of the globe.

Segments with a dilated adnate base, the upper ones confluent 1. *B. cartilagineum*.

Segments or pinnae, lower ones petiolulate, central adnate to the rachis, the uppermost more or less decurrent; margins serrate 2. *B. Whelani*.

Segments smooth and shining with very numerous fine parallel veins.

Segments serrulate, obliquely truncate at the base 3. *B. serrulatum*.

Segments with entire margins, mostly narrowed at the base 4. *B. orientale*.

1. **B. cartilagineum** (gristly), Swartz; Hook. Spec. Filic. iii. 43, *Syn. Filic.* 184; Benth. *Fl. Austr.* vii. 788. Rhizome short thick and woody, usually covered with shining black scales. Fronds 1 to 2 ft. long, the stipes usually scabrous. Segments numerous, 3 to 6 in. long, almost coriaceous, serrulate, distinctly veined, dilated and adnate at the base, the upper smaller ones confluent, the lower ones sometimes distant.—Metten. *Filic. Hort. Lips.* t. 5; R. Br. *Prod.* 152; F. v. M. *Fragm.* v. 120 Sieb. *Syn. Filic. n.* 123; Bail. *Litho. Ferns* Ql. 88; *B. striatum*, Sond. and Muell. in *Linnæ*, xxv. 717, not of Swartz.

Hab.: Rockingham Bay, *Dallachy*; Port Denison and Daintree River, *Pitzalan*; Rockhampton, *O'Shanesy*. Abundant in southern localities.

Var. *tropica*, Bail. *Fern World of Australia*. Rhizome elongated, ascending or erect to a foot high, and 2 to 3 in. thick. Frond as in the type only much larger.—Bail. *Litho. Ferns* Ql. 89.

Hab.: Wet situations tropical ranges.

2. **B. Whelani** (after Sergt. E. J. Whelan), Bail. 3rd *Suppl. Syn. Ql. Fl.* 92. Rhizome slender and erect, from 3 to 6 in. high, densely paleaceous at the summit, with ferruginous scales, and bearing a crown of many dark-green fronds; stipes blackish, slightly scabrous, clothed at the base with dark linear scales, about 1 ft. long and slender; the frond or leafy portion of about equal length with the stipes, bearing about 15 nearly opposite linear-lanceolate pinnae 3 to 6 in. long, the lowest of which are petiolulate, the central ones sessile, and one or two of the terminal ones having their bases adnate to the rachis, the margins serrated, teeth small and blunt, except those of the elongated point; veins simple or once forked; sori close to the costule on the lower half or three-fourths of the pinna.—Bail. *Litho. Ferns* Ql. 91.

Hab.: Bellenden-Ker, at an elevation of from 4,000 to 5,000 ft. above sea-level.

3. *B. serrulatum* (minutely serrate), *Rich.*; *Hook. Spec. Filic.* iii. 54; *Syn. Filic.* 186; *Benth. Fl. Austr.* vii. 789. "Bangwall," Moreton Bay, *T. L. Bancroft*; "Al-utha," Red Island, "Dugal," Tully River, *Roth.* Rhizome short and thick or longer and creeping. Fronds 1 to 2ft. long. Pinnæ distinct, linear or lanceolate, mostly 2 to 4in. long and nearly 3 lines broad or 4 lines when barren, obliquely truncate at the base but attached by the midrib only, serrulate, smooth and shining, the veins oblique very numerous and fine, mostly forked. Sori close to the midrib, the indusium soon concealed under them.—*Bail. Litho. Ferns* Ql. 90; *B. striatum*, *R. Br. Prod.* 152; *Hook. Spec. Filic.* iii. 55, t. 159; *Sieb. Syn. Filic.* n. 125, Fl. Mixt. n. 242; *F. v. M. Fragm.* v. 120.

Hab.: Cape York, *Daemel*; Rockingham Bay, *Dallachy*; Rockhampton, *Thozet*; Moreton Bay, *C. Stuart*.

Roots eaten after preparation.—*Bancroft and Roth.*

Dispersed over tropical America, the Malayan Archipelago and New Caledonia.

4. *B. orientale* (eastern), *Linn.*; *Hook. Spec. Filic.* iii. 52, *Syn. Filic.* 186, *Filic. Exot.* t. 77; *Benth. Fl. Austr.* vii. 789. Rhizome thick, rising to a short erect trunk. Fronds 2 to 3ft. long. Pinnæ distinct, 6in. to 1ft. long, $\frac{1}{2}$ to 1in. broad near the base, tapering to a long point, mostly cuneate at the base and attached by the midrib only, the numerous veins very fine as in *B. serrulatum*, but the margins quite entire. Sori close to the midrib and soon covering it. A few of the uppermost pinnæ occasionally adnate and decurrent on the rachis. *F. v. M. Fragm.* v. 120; *Bedd. Ferns S. Ind.* t. 22; *Bail. Litho. Ferns* Ql. 92.

Hab.: Rockingham Bay, *Dallachy*; Islands off the Coast, *Leeje, Walter*; Daintree River, *Pitzalan*; Gilbert River, *Daintree*, and most northern scrubs.

Also in East tropical Asia and in the South Pacific Islands.

26. MONOGRAMME, Schkuhr.

(From the Greek, alluding to the single line of sori.)

Rhizome slender, creeping. Fronds simple, narrow, veinless except the midrib. Sori in a single continuous line in the upper part of the frond, in a groove opening along the midrib, the margins of the groove forming an indusium along one or both sides of the sorus.

A small genus spread over the tropical and southern extratropical regions of the New and the Old World. The only Australian species extends over the area of the genus at least in the Old World.—*Benth.*

1. *M. Junghuhnii* (after —. *Junghuhn*), *Hook. Spec. Filic.* v. 123, *Syn. Filic.* 375, var. *tenella*; *Benth. Fl. Austr.* vii. 740. Rhizome almost filiform, intricately matted, covered with fine hairlike scales. Fronds slender and grass-like, 1 to 2½in. high, entire, scarcely $\frac{1}{2}$ line broad, flat with a prominent midrib in the lower barren part, the upper fertile half rather broader.—*Bedd. Ferns S. Ind.* t. 210; *F. v. M. Fragm.* vii. 110; *Bail. Litho. Ferns* Ql. 93; *Didclopteris angustissima*, *Brackenr. Filic. U. S. Expl. Exped.* 185, t. 17.

Hab.: Rockingham Bay, *Dallachy*.

27. DOODIA, R. Br.

(After Samuel Doody, a London apothecary.)

Rhizome tufted. Fronds simply pinnate or deeply pinnatifid. Sori oblong or shortly linear, on transverse veinlets connecting the forked veins proceeding from the midrib, in one or two rows parallel to the midrib on each side, with an indusium of the same shape, proceeding from the veinlet and opening on the inner side. Scabrous ferns, often small.

The species are found in New Zealand, the Pacific Islands and Ceylon. Fronds rarely exceeding 1ft., very scabrous. Pinnules or segments all adnate by their broad base. Sori ovate, in 1 or 2 rows between the midrib and the margin.

Lower or nearly all the pinnules attached only by the midrib, or the lowest petiolate. Sori oblong

1. *D. aspera*.

2. *D. caudata*.

1. **D. aspera** (rough), *R. Br. Prod.* 151; *Benth. Fl. Austr.* vii. 741. Fronds erect, rigid, mostly about 1 ft. or less but varying from 6 to nearly 18 in., the pinnules as well as the rhachis exceedingly scabrous. Pinnules or segments numerous, all attached by their broad or dilated base, rigidly serrulate, those in the centre of the frond lanceolate falcate, 1 to 8 in. long, the upper ones shorter and more confluent gradually reduced to the lanceolate point of the frond, the lower segments more distinct, gradually shorter, the lowest reduced to small wing-like appendages to the rhachis. Sori ovate or almost rounded, usually in one row on each side at a little distance from the midrib, but in the larger segments often numerous in at least two rows on each side.—Hook. Spec. Filic. iii. 71, Syn. Filic. 189, Exot. Fl. t. 8; Sieb. Fl. Mixt. n. 249; F. v. M. Fragm. v. 180; Bail. Litho. Ql. Ferns, 98; *Woodwardia aspera*, Metten.; Bail. Ql. Ferns, 27.

Hab.: Brisbane and Burnett Rivers, *F. v. Mueller*; Mount Ellicott, *Fitzalan*. A very common plant in southern scrubs.

Var. *heterophylla*, Bail. Syn. Ql. Fl. 704; Litho. Ferns, Ql. 94. Stipites slender, tufted. Frond 1 to 1½ ft. long, ½ to 2 in. broad, slightly scabrous, sometimes forked; rhachis with a narrow wing. Segments very narrow, ending in an elongated segment at the apex of from 5 to 6 in. in length, the abbreviated ones at the base often only forming slight lobes to the wing of rhachis. Sori close, often confluent, the wings to rhachis often also fertile, sterile fronds rigidly serrulate.

Hab.: Maroochie, on rocks.

2. **D. caudata** (tailed), *R. Br. Prod.* 151; *Benth. Fl. Austr.* vii. 741. A weak slender plant with the fronds often decumbent, the central ones ascending from 6 in. to 1 ft., slightly scabrous. Lower pinnæ distinct, short, ovate or ovate-lanceolate, often broadly biauriculate, attached by the midrib only and mostly barren; intermediate ones lanceolate falcate with a broad base, mostly fertile and attached by the midrib only, the upper ones more adnate, the uppermost short and confluent into a lanceolate or linear apex to the frond, but sometimes the whole frond consisting of short broad barren pinnæ, or the narrow fertile ones continued nearly to the base, and in some (Bail. Litho. Ferns Ql. 96) specimens the narrow almost entire apex occupying nearly the whole frond. Sori oblong, usually in a single row on each side of the midrib, and sometimes almost confluent.—Hook. Spec. Filic. iii. 75, Syn. Filic. 190, Exot. Fl. t. 25; Hook. f. Fl. Tasm. ii. 147; F. v. M. Fragm. v. 129; *D. rupestris*, Kaulf. in Sieb. Syn. Filic. n. 114, Fl. Mixt. n. 248; *Woodwardia caudata*, Cav.; Bail. Queensl. Ferns, 27.

Hab.: York Peninsula, *N. Taylor*; Rockingham Bay, *Dallachy*; Daintree River, *Fitzalan*; Rockhampton, Moreton Bay and other southern localities.

Also in New Zealand and the South Pacific Islands.

Var. *media*. Fronds often erect and from 1 to 1½ ft. long. Longer segments in the middle of the frond 1 to 2 in. long.—Bail. Litho. Ferns, Ql. 95; *D. media*, *R. Br. Prod.* 151; Hook. Spec. Filic. iii. 74, Syn. Filic. 190; *Woodwardia media*, Fée; Bail. Queensl. Ferns, 27.

Hab.: Common in both northern and southern localities.

28. ASPLENIUM, Linn.

(*A.*, privative; *splen*, the spleen; medicinal qualities.)

Rhizome creeping, or short and thick, or rising to a shortly arborescent trunk. Sori linear or rarely oblong, on veins proceeding from the midrib or the base of the pinnules or on their branches. Indusium linear or oblong, attached along one side to the vein and opening along the other side.

A large genus generally dispersed over the tropical and temperate regions of the globe.

SECT. I. **Euasplenium**.—Sori linear, diverging from the midrib or from the petiole towards the margin the indusium opening from the inner or upper edge outwards.

Fronds entire. Veins and sori parallel and transverse.

Fronds coriaceous, 1 to 6 ft. long, 3 to 8 in. broad. Veins closely

parallel, connected within the margin 1. *A. nidus*.

- Fronde thinner, 1 to 1½ ft. long, ¾ to 1½ in. broad. Veins mostly 1 line apart, not connected at the end 2. *A. simplistifrons*.
- Fronde linear-lanceolate, broken into segments only at the base. Veins very oblique, parallel 3. *A. attenuatum*.
- Fronde simply pinnate. Veins more or less tripartite or flabellate at the base of the pinnule, one branch usually elongated and penninerved. Fronde weak, diffuse. Pinnules obliquely obovate or fan-shaped, 3 to 6 lines broad 4. *A. flabellifolium*.
- Fronde diffuse, scaly-hirsute. Pinnules ovate fan-shaped or broadly lanceolate, 6 to 9 lines long 5. *A. paleaceum*.
- Fronde 6 to 13 in. long; pinnæ with the upper base truncate parallel with the rhachis, inferior base cut off in a curved line leaving the midrib at the margin 6. *A. resectum*.
var. *australense*.
- Fronde attaining 1 to 3 ft. Pinnules lanceolate, acuminate, 1½ to 6 in. long 7. *A. falcatum*.
- Fronde very weak 7 to 8 in. long; pinnæ membranous, few to 12, 3 to 9 lines long, the lower half cut away nearly to the midrib 8. *A. Wildii*.
- Veins numerous and parallel from the midrib. Pinnules oblong or lanceolate, coriaceous 9. *A. obtusatum*.
- Fronde bipinnate. Segments cuneate, striate. Fronde 3 to 8 in. long. Sori long and narrow 10. *A. Hookerianum*, var.
- Fronde 6 to 18 in. long. Primary pinnæ lanceolate, 1½ to 2 in. long, with distinct or confluent toothed segments 11. *A. furcatum*.
- Fronde bipinnate, 3 to 6 in. long, the inferior pinnules with a large cuneate auricle at the superior base 12. *A. affine*.
- Fronde 2 to 3 ft. long, thrice or four times pinnate, with numerous primary and secondary pinnæ. Sori small 13. *A. laserpitiifolium*.
- SECT. II. *Darea*.—Sori oblong or linear on a vein parallel to the margin of the teeth or lobes and opening towards the margin.
- Sori large with prominent indusia, one to each tooth or lobe of the pinnules. Fronde 1 to 2 ft. long, mostly bipinnate; pinnules lanceolate, ½ to 1 in. long 14. *A. bulbiferum*.
- Fronde mostly pinnate; pinnules very narrow, 3 to 6 in. long 15. *A. flaccidum*.
- SECT. III. *Athyrium*.—Sori small, often curved, mostly at the fork of the veinlets proceeding from the midrib.
- Fronde large, membranous, twice or thrice pinnate 16. *A. umbrosum*.
- SECT. IV. *Diplazium*.—Sori linear along veins pinnately diverging from a central vein to each lobe of the pinnule. Indusium narrow, opening, in the same frond, on the one or the other or both sides of the nerve.
- Fronde pinnate with pinnatifid pinnæ. Rhizome an erect trunk about 1 ft. high, 2 in. diameter. Pinnæ linear-lanceolate, petiolulate, 2 to 4 in. long 17. *A. Prenticei*.
- Rhizome creeping. Pinnæ deeply pinnatifid the lower lobes often divided to the midrib 18. *A. japonicum*.
- Rhizome short thick. Pinnæ pinnatifid with short broad lobes 19. *A. sylvaticum*.
- Fronde large, bipinnate. Trunk erect or shortly arborescent. Lobes of the secondary pinnæ mostly broad and short. Sori and indusia narrow-linear 20. *A. maximum*.
- Lobes of the secondary pinnæ mostly triangular or lanceolate. Sori and indusia short and oblong 21. *A. polypodioides*.
- SECT. V. *Anisogonum*.—Sori and indusia of *Diplazium* but the lateral veinlets of each set frequently anastomosing with those of the adjoining set.
- Fronde large, pinnate, the pinnæ 6 to 12 in. long, 1 to 1½ in. broad 22. *A. decussatum*.

1. *A. nidus* (a nest), Linn.; Hook. Spec. Filic. iii. 77, Syn. Filic. 190; Benth. Fl. Austr. vii. 744. Bird's-nest Fern. Rhizome short and thick. Fronde usually simple, entire, lanceolate, sessile or nearly so in large regular tufts hollowed in the centre, the larger ones 2 to 6 ft. long and 8 to 9 in. broad. Veins numerous, nearly transverse, parallel, simple or forked, connected at the end in an intramarginal line. Sori along the upper or inner side of nearly all the veins,

mostly reaching from the midrib to $\frac{1}{2}$ or nearly $\frac{3}{4}$ of their length.—Bot. Mag. t. 8101; Bail. Litho. Ferns Ql. 97; R. Br. Prod. 150; F. v. M. Fragm. v. 180; *A. australasicum*, Hook Filic. Exot. t. 88; *Thamnopteris nidus*, Presl. Bedd. Ferns Brit. Ind. t. 197.

Hab.: Broadsound, *R. Brown*; York Peninsula, *N. Taylor*; Rockingham Bay, *Dallachy*; Daintree River, *Fitzalan*; Moreton Bay, *F. v. Mueller*; Rockhampton and neighbouring districts, *Bowman*, *Thozet* and others.

Widely spread over tropical Asia, extending to the Mascarene Islands on the one hand and to the Pacific Islands on the other.

Var. *multilobum*, Bail. Ql. Agri. Journ. i. 370, with plate. This differs from the type in that its fronds for three parts of their length are much lobed, the lobes often exceeding 6in. in length.

Hab.: Range near Kamerunga, *L. J. Nugent*.

Fronds of this fern have been met with that were more or less lobed but never so much so as in the variety under notice.

2. ***A. simplicifrons*** (frond simple), *F. v. M. Fragm. v. 74*; *Benth. Fl. Austr. vii. 744*. Rhizome scaly. Fronds entire, membranous, 1 to 1½ ft. long, $\frac{3}{4}$ to 1½ in. broad, tapering to a point and decurrent on the short stipes. Veins transverse, simple or forked, mostly about 1 line apart, not connected with the margin. Sori linear, not reaching either the margin or the midrib.—Hook. and Bak. Syn. Fil. 19; Bail. Litho. Ferns Ql. 98.

Hab.: Bellenden-Ker Range, *W. Hill*; Rockingham Bay, *Dallachy*; York Peninsula, *N. Taylor*.

Var. *laciniatum*, Bail. Bot. Bull. xiii. with plate showing the two forms of frond. Differs from the nominal form in having the fronds forked and lacinated.

Hab.: Near Kuranda, *Hobson*.

3. ***A. attenuatum*** (attenuated), *R. Br. Prod. 150*; *Benth. Fl. Austr. vii. 745*. Rhizome tufted. Fronds in the typical form linear-lanceolate, 6in. to 1ft. long, $\frac{1}{2}$ to $\frac{3}{4}$ in. broad, entire the greater part of their length and tapering into a long point, often proliferous at the end, usually broken up in the lower part into a few obovate or oblong laterally adnate segments, the midrib scaly hairy underneath as well as the stipes. Veins very oblique, simple or forked. Sori variable in length, often reaching the midrib, rarely the margin.—Hook. Spec. Filic. iii. 92, Syn. Filic. 194, Ic. Pl. t. 914; Hook. and Grev. Ic. Filic. t. 220; F. v. M. Fragm. v. 180; Bail. Litho. Ferns Ql. 99.

Hab.: Moreton Bay, *A. Cunningham*, *F. v. Mueller* and others; Head of the Dee River, *Bowman*. Very common.

Var. *multilobum*, F. v. M. The greater part of the frond broken up into segments, but ending in the long entire point of *A. attenuatum*.—*A. paleaceum*, var. *Prenticei*, Bak. Syn. Fil. 208; Bail. Litho. Ferns Ql. 100.

Hab.: Logan District, *Prentice*.

Var. *Schneideri*, Bail. Syn. Ql. Fl. 706 and Litho. Ferns Ql. 101. Fronds 12 to 18in. long, 2 to 8in. broad, long attenuate, pinnate below, pinnatifid in the upper portion; proliferous at the apex; pinnae very irregular as to form and size, decurrent upon the rachis.

Hab.: Nerang Creek, *H. Schneider*.

Var. *integrum*, Bail. Syn. Ql. Fl. 706, and Litho. Ferns Ql. 99. Fronds quite entire, stipites often long.

Hab.: Maroochie and Eumundi, North Coast Railway Line.

4. ***A. flabellifolium*** (fan-shaped leaflets), *Cav.*; *Hook. Spec. Filic. iii. 146*, *Syn. Filic. 195*, *Exot. Fl. t. 208*; *Benth. Fl. Austr. vii. 745*. Rhizome tufted. Fronds weak, straggling or prostrate, slender, from a few in. to 1ft. long, simply pinnate. Pinnæ shortly petiolate, obliquely obovate orbicular or fan-shaped, toothed and the larger ones sometimes 8-lobed, 2 to 3 lines broad in the smaller specimens, $\frac{1}{2}$ in. in the larger ones. Veins few, forked, pinnately diverging from a short midrib often divided at the base into 3 nearly equal branches. Sori

several on each pinna, linear when young, often confluent when old.—R. Br. Prod. 150; Sieb. Fl. Mixt. n. 286; Hook. f. Fl. Tasm. ii. 145; F. v. M. Fragm. v. 181; Bail. Litho. Ferns Ql. 102.

Hab.: On rocks near Stanthorpe and other southern localities.
Also in New Zealand.

5. ***A. paleaceum*** (scaly). R. Br. Prod. 150; Benth. Fl. Austr. vii. 746. Rhizome tufted. Fronds decumbent, 6in. to 1ft. long, simply pinnate, sometimes proliferous at the end, the stipes rhachis and often the principal veins scaly-hirsute. Pinnæ shortly petiolate, ovate ovate-lanceolate or fan-shaped, mostly $\frac{1}{2}$ to $\frac{3}{4}$ in. long, irregularly denticulate and sometimes obscurely 3-lobed, prominently striate with the radiating forked veins more or less joining in a midrib. Sori linear, often long but not reaching the midrib.—Hook. Spec. Filic. iii. 162, t. 199, Syn. Filic. 208; F. v. M. Fragm. v. 181; Bail. Litho. Ferns Ql. 108.

Hab.: Broadsound, R. Brown; Frankland Islands, M'Gillivray; York Peninsula, N. Taylor; Rockingham Bay, Dallachy; Rockhampton, Bowman, O'Shanesy, Thozet; Mackay.

6. ***A. resectum*** (cut off), Sm.; var. *australiense*, Bail. 1st Suppl. Syn. Ql. Fl. 64. Rhizome shortly creeping. Stipes close together, slender, 4 to 11in. long, glossy, nearly black. Frond pinnate, membranous, 6 to 13in. long, with a rather long, caudate, serrate apex; lower pinnæ 3 or 4in. long, and about $\frac{1}{2}$ in. broad at the base, from which they gradually diminish in size until they reach the tail-like apex of the frond. Pinnæ distinctly petiolulate except at the apex, where the fronds become pinnatifid, subfalcate, and the sterile ones often obtuse, but the fertile ones usually with elongated points, superior base, truncate, parallel with the rhachis, never auricled, inferior base for a third or more of their length cut off as it were in a curved line, so that the costule here becomes the margin, the whole of the rest of the pinnæ evenly serrated, veins forked. Sori oblong, occupying the centre of pinna, about an equal distance from the margin as from costule.—Bail. Litho. Ferns Ql. 107.

Hab.: Johnstone River, W. R. Kefford.

7. ***A. falcatum*** (falcate), Lam.; Hook. Spec. Filic. iii. 160, Syn. Filic. 208; Benth. Fl. Austr. vii. 746. Rhizome tufted. Fronds from under 1ft. to 3ft. high including the rather long stipes, glabrous or sparingly scaly-hirsute, simply pinnate. Pinnæ shortly petiolate, oblique, lanceolate, acuminate, serrulate, and usually more or less distinctly pinnatifid with short broad dentate lobes and sometimes auriculate at the base, $1\frac{1}{2}$ to 4in. long, coriaceous, prominently striate, the veins very oblique diverging from the base and from the midrib. Sori linear, long and nearly reaching the margin, or a few quite short.—R. Br. Prod. 150; F. v. M. Fragm. v. 181; *A. caudatum*, Forst.; Hook. Spec. Filic. iii. 152, Syn. Filic. 209; Bail. Litho. Ferns Ql. 104.

Hab.: Brisbane River, Moreton Bay, A. Cunningham, F. v. Mueller; Rockhampton, O'Shanesy; Rockingham Bay, Dallachy.

Widely spread over tropical Africa, Asia, the Pacific Islands and New Zealand.—Beddome Ferns S. Ind. t. 141 and 143, figures *A. falcatum* and *A. caudatum* from specimens much more paleaceous than any Australian ones, but all appear to represent one species.—Benth.

Var. *Whittlei*. So far as known this form differs only in its smaller size and having the apex of the frond much and deeply laciniated.

Hab.: Rockhampton, Rob. Whittle.

8. ***A. Wildii*** (after C. J. Wild), Bail. Bot. Bull. iv. 20. Rhizome long, creeping, slender. Fronds distant or somewhat caespitose, very weak, often flexuose, 7 to 8in. long including the filiform stipes which occupies half its length. Stipes mahogany-brown, glossy and slightly scaly at the base. Pinnæ quite membranous, from very few to 12, the lower ones free, the upper ones forming a pinnatifid apex which is sometimes slightly elongated, horizontally approximate,

3 to 9 lines long, 3 to 4 lines broad near the base, where the upper half is truncate and parallel with the rhachis, while the lower half is obliquely cut away nearly to the midrib; the apex obtuse or on the upper segments or pinnæ nearly acute, margins crenate. Costa very slender, veins distant, simple or forked, very oblique. Sori rather long, distant from the costa but approaching the margin.—Bail. Litho. Ferns Ql. 108.

Hab.: On rocks, Daintree River, C. J. Wild.

9. **A. obtusatum** (obtuse), Forst.; Hook. Spec. Filic. iii. 96, Syn. Filic. 207, Filic. Exot. t. 46; Benth. Fl. Austr. vii. 747. Rhizome thick, scaly. Fronds 6 in. to about 1 ft. high, the rhachis and stipes usually rather thick, glabrous or sparingly scaly. Pinnæ coriaceous, shortly petiolate, in the typical for mobliquely-oblong or ovate-lanceolate, obtuse, $\frac{3}{4}$ to $1\frac{1}{2}$ in. long, regularly crenate-toothed, and from that in some varieties to lanceolate, 3 to 5 in. long, toothed or pinnatifid. Veins from the midrib oblique and forked. Sori oblong-linear, not reaching the margin, usually several on each side of the midrib oblique equal and parallel.—Labill. Pl. Nov. Holl. ii. 93, t. 242; R. Br. Prod. 151; Hook. f. Fl. Tasm. ii. 145; Bail. Litho. Ferns Ql. 105; *A. obliquum*, Forst.; Labill. l.c. 93, t. 242; *A. lucidum*, Forst. i Hook. f. Fl. Tasm. ii. 146.

Hab.: Nerang, H. Schneider; Islands of Moreton Bay, J. Shirley.

Var. *difforme*. Pinnæ very obtuse, more or less pinnatifid.—*A. difforme*, R. Br. Prod. 151; Sieb. Syn. Filic. n. 119, Fl. Mixt. n. 267; Bail. Litho. Ferns Ql. 106.

The species is also in New Zealand and in extratropical South America.

10. **A. Hookerianum** (after Sir W. J. Hooker), Colens.; var., Bail. 3rd Suppl. Syn. Ql. Fl. 93. Rhizome erect or shortly repent, the crown and base of stipes densely clothed with dark-brown scales; stipes tufted, slender, 4 or 5 in. long, dark-brown and slightly scaly. Fronds bipinnate, narrow-lanceolate in outline, attaining 8 in. in length, and not over 3 in. wide in the broadest part; pinnules cuneate, the lower ones often divided to the base, the end inciso-dentate. Sori usually long and narrow.—Bail. Litho. Ferns Ql. 112.

Hab.: Whelanian Pools, Bellenden-Ker.

11. **A. furcatum** (forked), Thunb.; Hook. Spec. Filic. iii. 165, Syn. Filic. 214; Benth. Fl. Austr. vii. 747. Rhizome thick, dark-brown, scaly-hairy. Fronds 6 to 18 in. high, pinnate or bipinnate, slightly scaly-hairy. Pinnæ lanceolate, mostly $1\frac{1}{2}$ to 2 in. long, deeply pinnatifid or pinnate; segments varying from oblong-cuneate toothed and confluent to linear-cuneate distinct and deeply 2 to 4-lobed, the segments or lobes all coriaceous, denticulate at the end, striate with few diverging veins. Sori few, large.—Bedd. Ferns S. India, t. 144; F. v. M. Fragm. v. 181; Bail. Litho. Ferns Ql. 109; *A. pramorsum*, Swartz; R. Br. Prod. 150.

Hab.: Bunya Mountains at the Great Falls, Thos. Tate.

Widely spread over tropical America and southern Africa and the Pacific Islands.

12. **A. affine** (resembling another), Sw., Hook. Sp. Filic. iii. 169. Rhizome stout, subrepent, clothed above with copious, almost black, subulate scales; stipites aggregated, dark-brown; 4 to 10 in. high, partially and deciduously setose-paleaceous, subcoriaceous, dark-brown (when dry), opaque, bipinnate, pinnate only at the apex; pinnæ petiolate, rather distant, 3 to 6 in. long; pinnules $\frac{1}{2}$ to 1 in. long, petiolulate, obliquely rhombic-ovate, obtuse or subacuminate, sublobate, unequally serrated in their superior half, terminal ones small and confluent into a pinnatifid apex, inferior pinnules with a large cuneate auricle at the superior base sometimes free, and sometimes though rarely the pinnules are again pinnated. Veins erect, parallel, subflabellate (giving a striated appearance), no distinct costa. Sori copious, linear but varying in length. Indusium firm, membranous.—Bail. Litho. Ferns Ql. 110.

Hab.: Cooparoo Creek, Russell River, C. J. Wild.

18. ***A. laserpitilifolium*** (*Laserpitium*-leaved), *Lam.*; *Hook. Spec. Filic.* iii. 171, t. 208, *Syn. Filic.* 215; *Benth. Fl. Austr.* vii. 748. Rhizome thick, subrepent, clothed at the extremity with rusty subulate scales. Fronds $1\frac{1}{2}$ to 3ft. long, glabrous, 8 or 4 times pinnate. Larger primary pinnae 6 to 8in. long, with numerous secondary pinnae of 1 to 2in. again pinnate or the upper ones shorter and pinnatifid only, the primary as well as the secondary pinnae tapering to a pinnatifid point. Ultimate pinnules or segments obovate or oblong-cuneate, toothed, prominently striate with diverging veins, mostly 3 or 4 lines long. Sori several on each segment, linear, usually rather small.—*Bedd. Ferns S. Ind.* t. 225; *Bail. Litho. Ferns* Ql. 111.

Hab.: Endeavour River, *A. Cunningham*; Rockingham Bay, *W. Hill, Dallachy*; Daintree River, *Fitzalan*; Fitzroy Island, *M. Gillivray, Walter*.

Also in East tropical Asia, the Malayan Archipelago and South Pacific Islands.

14. ***A. bulbiferum*** (bulb-bearing), *Forst.*; *Hook. Spec. Filic.* iii. 196, *Pl. t.* 428, *Syn. Filic.* 218; *Benth. Fl. Austr.* vii. 748. Rhizome thick. Fronds 1 to 2ft. long, glabrous or with a scaly rhachis, pinnate or more frequently bipinnate, often proliferous. Primary pinnae numerous, usually 8 to 4in. long. Pinnules lanceolate, mostly $\frac{1}{2}$ to 1in. long, pinnately toothed lobed or divided, with a single veinlet to each lobe or tooth; the whole frond as well as each pinna ending in a lanceolate toothed or lobed point. Sori large, one to each lobe or tooth, affixed to the central vein but the rather rigid prominent indusium thrown over towards the upper margin so as to make the sorus appear marginal.—*Hook. f. Fl. Tasm.* ii. 146; *Bail. Litho. Ferns* Ql. 118; *Ceanopteris appendiculata*, *Labill. Pl. Nov. Holl.* ii. 94, t. 248; *Asplenium laxum*, *R. Br. Prod.* 151.

Hab.: Met with in a few southern localities.

Scattered over various tropical and southern extratropical regions of the New and the Old World.

15. ***A. flaccidum*** (flaccid), *Forst.*; *Hook. Spec. Filic.* iii. 205, *Syn. Filic.* 222; *Benth. Fl. Austr.* vii. 749. Rhizome short and thick. Fronds from under 1ft. to near 2ft. or still longer, pale green, glabrous, pinnate. Pinnae coriaceous, narrow, 8 to 6in. long, the barren ones toothed, the fertile pinnately divided into linear lobes of 2 to 6 lines, each bearing a single rather large sorus attached to the central vein, but the conspicuous indusium thrown over to the upper side so as to appear marginal.—*Hook. f. Fl. Tasm.* ii. 146; *A. odontites*, *R. Br. Prod.* 151.

Hab.: Spring Creek, Killarney, *M. E. Milward*.

Also in New Zealand.

16. ***A. umbrosum*** (shady), *J. Sm.*; *Hook. Spec. Filic.* iii. 281, *Syn. Filic.* 229; *Benth. Fl. Austr.* vii. 749. Caraway-seed Fern. Fronds 3 to 5ft. long, 1 to $1\frac{1}{2}$ ft. broad, twice or thrice pinnate. Pinnules membranous, lanceolate or oblong, 1 to 2in. long, deeply pinnatifid or smaller and pinnately toothed; veins oblique, usually forked, proceeding from the midrib into the lobes or teeth, free. Sori small, oblong, usually on the vein below the fork or partly on one fork and then slightly curved. Indusium membranous, proceeding from the vein, and opening on the upper or inner margin, the sori often at length covering the centre of the pinnule.—*F. v. M. Fragm.* v. 182; *Bail. Litho. Ql. Ferns*, 114; *Allantodia australis* and *A. tenera*, *R. Br. Prod.* 149; *Asplenium Brownii*, *J. Sm.*; *Hook. Ic. Pl. t.* 978; *Hook. f. Fl. Tasm.* ii. 147; *A. australis*, *Brackenr.*; *Hook. Spec. Filic.* iii. 282; *A. phytosorus*, *Sieb. Fl. Mixt.* n. 268.

Hab.: Common in southern scrubs.

Ranges over tropical Africa and Asia and is also in Norfolk Island and New Zealand.

Var. *tenera*, *Bail. Syn. Ql. Fl.* 708; *Litho. Ferns* Ql. 115. This is more membranous than the type, the stipites also are darker and more slender. Sori more distant and the indusium is not so often broken at maturity.

Hab.: Common in swamps in southern scrubs.

17. **A. Prenticei** (after Dr. Chas. Prentice), *Bail. Proc. Linn. Soc. N.S.W.* iv. 87. Rhizome an erect caudex, exceeding 1ft. high, diameter about 2in., bearing the black base of old stipites mixed with black scales. Fronds 1 to 2ft. long, simply pinnate, stipes and rhachis more or less covered with black hair-like scales particularly dense at the base. Pinnæ petiolulate, 2 to 4in. long, linear-lanceolate, serrulate or the ends sharply serrate, base obliquely truncate, terminal pinnæ 5 to 6in. long, sometimes deeply lobed at the base. Veins once-forked, simple at the apex, terminating at the margin, the upper veinlet of each fork except those near the apex soriferous. Sori narrow, occupying nearly the length of the veinlet. Indusium broad and firm.—*Bail. Litho. Ferns* Ql. 116.

Hab.: Sides of creeks, Trinity Bay Ranges, *Bailey*.

Habit of *Diplazium*, but I have never met with a diplazioid sorus.

18. **A. japonicum** (of Japan), *Thumb. ; Hook. and Bak. Syn. Filic.* 234 ; *Benth. Fl. Austr.* vii. 750. Rhizome slender, creeping. Fronds pinnate, 1 to 1½ft. long. Larger pinnæ 3 to 4in. long, deeply pinnatifid, the lower segments reaching the shortly scaly-hirsute rhachis. Sori usually rather shorter than in *A. sylvaticum*.—*Bail. Litho. Ferns* Ql. 117.

Hab.: Upper Nerang, *Schneider*.

19. **A. sylvaticum** (growing amongst trees), *Presl ; Hook. Spec. Filic.* iii. 248, *Syn. Filic.* 232 ; *Benth. Fl. Austr.* vii. 750. Rhizome short thick and scaly. Fronds pinnate, from 1 to above 2ft. long. Pinnæ membranous, mostly attached by the midrib only or shortly petiolate, the larger ones 6in. long, $\frac{3}{4}$ to 1in. broad, regularly pinnatifid with short rounded denticulate lobes, with a central vein to each lobe and several oblique parallel veinlets proceeding from it, bearing linear sori extending from the midrib almost to the margin ; indusia of the section, single or double ; upper pinnæ gradually smaller and more entire, the uppermost semi-decurrent or confluent.—*Bedd. Ferns S. Ind.* t. 161 ; *Bail. Litho. Ferns* Ql. 118.

Hab : Most of the northern scrubs.

Extends over tropical Africa and Asia including the Malayan Archipelago.

20. **A. maximum** (very large), *Don ; Hook. and Bak. Syn. Filic.* 239 ; *Benth. Fl. Austr.* vii. 751. Trunk erect, from a few in. to 2½ft. high. Fronds bipinnate, several ft. long and 2 to 3ft. broad, the larger pinnæ closely resembling the entire fronds of *A. sylvaticum*. Secondary pinnæ lanceolate, acuminate, 3 to 6in. long, $\frac{3}{4}$ to 1in. broad, pinnatifid with short broad denticulate lobes, but the larger ones more deeply so than in *A. sylvaticum* and the smaller lobes more oblique and acutely toothed, the pinnæ ending in a long lanceolate serrated point, the rhachis glabrous or slightly scaly. Sori narrow-linear and indusia entirely those of *A. sylvatica*.—*Bail. Litho. Ferns* Ql. 119.

Hab.: Rockingham Bay, *W. Hill, Dallachy* ; Daintree River, *Fitzalan* ; Talleb udgera, *Schneider* ; North Coast Line.

Common in East India.

21. **A. polypodioides** (Polypodium-like), *Metten. ; Hook. Spec. Filic.* iii. 257, *Syn. Filic.* 238 ; *Benth. Fl. Austr.* vii. 751. Trunk erect, attaining sometimes 8 or 4ft. Fronds bipinnate, several feet long, 1 to 2ft. broad at the stipes and rhachis without scales. Secondary pinnæ mostly 3 to 4in. long, lanceolate, shortly petiolate, acuminate, more or less deeply pinnatifid towards the base, the lower lobes lanceolate, falcate, minutely serrulate, the upper ones gradually shorter. Sori on the pinnate veins of the lobes as in the preceding species, but much shorter, rather oblong than linear. Indusia of the section opening on one or both sides of the vein.—*F. v. M. Fragm.* v. 182 ; *Bail. Litho. Ferns* Ql. 120 ; *Diplazium polypodioides*, *Metten. ; Bedd. Ferns S. Ind.* t. 163.

Hab.: Rockingham Bay, growing frequently in water, *Dallachy* ; Daintree River, *Fitzalan* ; also in some southern scrubs.

Spread over East India and the Malayan Archipelago.

22. *A. decussatum* (decussate), Swartz; Hook. *Spec. Filic.* iii. 270, *Syn. Filic.* 248; *Benth. Fl. Austr.* vii. 751. Trunk very stout, erect, scaly. Fronds 8 to 4ft. long, pinnate, with a thick smooth rhachis, often proliferous. Pinnæ often thick coriaceous, shortly petiolate or attached by the midrib only, lanceolate, acuminate, 6in. to near 1ft. long, 1 to 1½ in. broad, shortly dentate or some of the larger ones pinnatifid or almost pinnate. Primary veins proceeding obliquely from the midrib to the teeth or lobes, with secondary obliquely pinnate veinlets often anastomosing. Sori linear, on the secondary veinlets, with the single or double indusium of the section.—Bail. *Litho. Ferns* Ql. 121; *Callipteris prolifera*, Bory; Bail. *Queensl. Ferns*, 32.

Hab.: Rockingham Bay, *W. Hill, Dallachy*; Daintree River, *Fitzalan*; Russell River, *Bailey*.

Also in tropical Africa, the Malayan Archipelago and Pacific Islands.

29. *ASPIDIUM*, Swartz.

(The indusium of some species shield-shaped.)

Rhizome thick and shortly erect or creeping. Fronds once twice or thrice-pinnate, rarely in species not Australian, simple. Sori orbicular, usually small, variously dispersed over the under surface. Indusium orbicular, covering the sorus when young, attached by the centre or by a point or in a sinus on one side, so that when opened all round by the growth of the spore-cases it becomes peltate or more or less reniform.

A large genus, distributed over every part of the globe, closely allied to *Polypodium*, with nearly as great a variety of division and venation of the frond, differing only in the presence of indusium which in several species disappears very early.

SECT. I. *Nephrolepis*.—Fronds pinnate, with numerous nearly equal pinnæ articulate on a long rhachis. Sori in a regular row close to or not far from the margin.

Pinnæ rather rigid, obliquely truncate or cordate at the base.

Pinnæ rarely above 1in. long, obliquely cordate 1. *A. cordifolium*.

Pinnæ 2 to 5in., obliquely truncate at the base 2. *A. exaltatum*.

Pinnæ membranous, narrow and tapering at the base on one side, broadly auriculate on the other. 3. *A. ramosum*.

SECT. II. *Nephrodium*.—Fronds pinnate. Pinnæ pinnatifid with a pinnate vein leading to each lobe, the veinlets under adjoining lobes uniting in a vein leading to the sinus. Lower pinnæ scarcely smaller than the others.

Sori in 2 rows near the margin of the lobes usually continued into the entire part. 4. *A. unitum*.

Sori close to the margins of the lobes and not continued below the sinus 5. *A. pteroides*.

Lower pinnæ gradually much smaller and distant.

Fronds rarely above 2ft. long. Lobes of the pinnæ rather obtuse or acute 6. *A. molle*.

Fronds often 4 to 5ft. long. Lobes of the pinnæ broad, very obtuse or truncate 7. *A. truncatum*.

SECT. III. *Sagenia*.—

Fronds deeply pinnatifid or pinnate, with reticulately veined pinnæ 8. *A. confluens*.

SECT. IV. *Polystichum*.—Fronds twice or thrice pinnate with lobed or toothed segments. Indusium usually peltate.

Stipes very shaggy. Segments ovate-lanceolate, prickly toothed, with an angular lobe at the base 9. *A. aculeatum*.

Stipes slightly scaly. Segments lanceolate, pinnatifid or pinnate, the teeth mostly aristate 10. *A. aristatum*.

SECT. V. *Lastrea*.—Fronds twice or thrice pinnate with lobed or toothed segments. Indusium usually reniform, often very small and soon disappearing, sometimes abortive.

Fronds glabrous or pubescent. Segments acutely toothed or lobed. Sori near the midrib 11. *A. decompositum*.

Fronds villous, 3 to 7in. long 12. *A. acuminatum*, var. *villosum*.

Segments acutely toothed or pinnatifid. Sori near the margin 13. *A. tenerum*.

1. ***A. cordifolium*** (leaves cordate), Swartz, *Syn. Filic.* 45; *Benth. Fl. Austr.* vii. 754. Rhizome emitting wiry fibres bearing ovoid scaly tubers. Fronds 1 to 2ft. long, weak, simply pinnate. Pinnæ very numerous and regularly approximate, nearly sessile but articulate on the rhachis, oblong, rounded and usually denticulate at the end, $\frac{3}{4}$ to 1in. long, obliquely cordate at the base with the upper auricle much the largest, gradually smaller at the end of the frond, and the lowest pinnæ short broad and barren. Veins obliquely diverging from the midrib, forked or branched. Sori terminating each upper branch, forming a row at some distance from the margin. Indusium orbicular, very prominent, attached in a deep sinus or rarely peltate.—Bail. Litho. Ferns Ql. 122; *Nephrolepis coraifolia*, Presl; Hook. and Bak. *Syn. Filic.* 800; *Aspidium tuberosum*, Bory; F. v. M. *Fragm.* v. 186; *Nephrolepis tuberosa*, Presl; Hook. *Spec. Filic.* iv. 151; *Bedd. Ferns S. Ind.* t. 92.

Hab.: Rockingham Bay, *Dallachy*; Brisbane River, Moreton Bay, *W. Hill*, *F. v. Mueller*. Spread over the tropical regions of the New and the Old World.

2. ***A. exaltatum*** (tall), Swartz, *Syn. Filic.* 45; *Benth. Fl. Austr.* vii. 754. Fronds weak, often above 2ft. long, simply pinnate, the rhachis glabrous or loosely scaly-tomentose. Pinnæ very numerous, nearly sessile but articulate on the rhachis, lanceolate, mostly acuminate and crenate, obliquely truncate at the base and sometimes auriculate on the upper side, the longer ones 3 to 5in. long, with numerous fine forked veins obliquely diverging from the midrib, the lower pinnæ usually shorter rounded at the end and barren. Sori terminating one branch of the veins, forming a regular row usually close to the margin. Indusium orbicular, laterally attached in a deep sinus or sometimes peltate and opening all round.—F. v. M. *Fragm.* v. 186; Bail. Litho. Ferns Ql. 123; *Nephrodium exaltatum*, R. Br. *Prod.* 148; *Nephrolepis exaltata*, Schott; Hook. *Spec. Filic.* iv. 152, *Syn. Filic.* 301.

Hab.: Port Bowen, *R. Brown*, *A. Cunningham*; Cape York, *Daemel*; York Peninsula, *N. Taylor*; Endeavour River, *A. Cunningham*; Rockingham Bay, *W. Hill*, *Dallachy*; Daintree River and Port Denison, *Fitzalan*; Gilbert River, *Daintree*; islands off the coast, *McGillivray*, *Thozet* and others.

Widely spread over the tropical regions of the New and the Old World.

Var. *longipinna*. Larger pinnæ 6in. long. $\frac{1}{2}$ to $\frac{3}{4}$ in. broad, with the row or sori at a considerable distance from the margin.—Bail. Litho. Ferns, Ql. 124.

A large and common fern among the rocks of the tropical coast.

3. ***A. ramosum*** (branching), *Beauv. Fl. Ov. et Ben.* ii. 53, t. 91; *Benth. Fl. Austr.* vii. 754. Rhizome slender, scaly, creeping up the stems of trees to a great length. Fronds weak, varying from 6in. to above 12in. long. Pinnæ numerous, of very irregular length, some exceeding 1 $\frac{1}{2}$ in. long, tapering from the base to an acuminate point, others on the same frond not more than half that length and obtuse, breadth about 4 lines, obliquely oblong, obtuse, crenate, very oblique at the base, articulate on the rhachis, the lower side narrowed the upper broadly truncate and often auriculate. Veins diverging from the midrib once or twice forked. Sori in a regular row between the midrib and the margin. Indusium orbicular, usually attached in a deep sinus but sometimes peltate.—Bail. Litho. Ferns Ql. 125; *Nephrolepis ramosa*, T. Moore; Hook. and Bak. *Syn. Filic.* 301; *Nephrodium oblitteratum*, R. Br. *Prod.* 148; *Aspidium oblitteratum*, Spreng. *Syst.* iv. 99; F. v. M. *Fragm.* v. 185; *Nephrolepis oblitterata*, Hook. *Spec. Filic.* iv. 154; *Bedd. Ferns S. Ind.* t. 251; *Polypodium? Beckleri*, Hook. *Spec. Filic.* iv. 224; *N. repens*, Brackenr.; Bail. Ql. Ferns, 50; *N. altescandens*, Bail. l. c. 51, not of Baker. The above synonyms are all forms of the species.

Hab.: Northern scrubs.

Var. *lineare*, 3rd Suppl. *Syn. Ql. Fl.* 93. Rhizome pubescent, very slender, climbing like Ivy up to stems of trees and shrubs, often 10 or 12ft. Fronds crowded, linear in outline, 6 to 15in. long and seldom exceeding 1in. broad; pinnæ 30 to 40 on each side of the rhachis, not exceeding

8 lines long in the centre of frond and much smaller towards each end, obliquely oblong, the upper margin slightly crenulate, with a short blunt auricle at the base, lower margin nearly straight, base parallel with the rhachis; terminal pinna lanceolate or somewhat rhomboidal; veins once forked; sori on the end of the upper branch usually at a distance from the margin.—Bail. Litho. Ferns Ql. 126a.

Hab.: Tringilburra Creek, Bellenden Ker, and other tropical localities.

Var. *eumundi*. Rhizome slender, more or less hairy, often very intricate, forming dense, matted masses upon damp rocks, the fronds thus very numerous, and not unlike the moss *Cyathophora pleridioides*, 1 to 2 in. long, with the pinnae not close, and only 1 or 2 lines long; these are never found bearing sori. From these moss-like masses proceed filiform stems, which creep up the adjoining trees or shrubs, and bear fertile fronds, narrow-lanceolate in outline, often falcate, 3 to 6 in. long, stipites very short or none; the rhachis clothed with soft, white hairs and distant brown scales. Pinnae oblong, the centre ones 3 to 6 lines long, from which they diminish in size towards each end, the apical ones being only about $\frac{1}{2}$ line in diameter, and the basal ones but little larger, all softly hairy, the lower margin entire, upper crenulated, base truncate, and parallel with the rhachis, with a more or less prominent auricle on the upper side; costular vein flexuose nearer the lower than the upper margin, veinlets often shortly forked. Indusium large for the size of the frond; orbicular reniform, persistent.—*A. eumundi*, Bail. Bot. Bull. v; Bail. Litho. Ferns Ql. 126a.

Hab.: Condamine, C. H. Hartmann; Tallebudgera, J. F. Shirley; Eumundi, J. F. Bailey and J. H. Simmonds.

Spread over tropical Africa and Asia and the Pacific Islands.

4. *A. unitum* (united), Swartz.; *Syn. Fil.* 47; *Benth. Fl. Austr.* vii. 755. Rhizome stout, creeping. "Tchungooin," Bundaberg, *Keys*. Fronds 1 to 2 ft. long on a stipes often as long, simply pinnate, glabrous. Pinnae narrow-lanceolate, 3 to 6 in. long, sessile but not adnate or the lower ones shortly petiolate, rather firm, regularly pinnatifid, the lobes usually reaching to about the middle, broad, rather acute, often falcate. Veins pinnate to each lobe, the branches or veinlets of adjoining lobes uniting in a vein leading to the sinus. Sori at the end of the veinlets forming usually a close row along the margin of the lobes. Indusium orbicular-reniform or almost peltate, very small and soon disappearing.—F. v. M. *Fragm.* v. 135; Bail. Litho. Ferns Ql. 127; *Nephrodium unitum*, R. Br. *Prod.* 148.

Hab.: Endeavour River, Banks and Solander; Lizard Island, M'Gillivray; York Peninsula, N. Taylor; Rockingham Bay, Dallachy; Port Denison, Fitzalan; Rockhampton, Thozet; Brisbane River, Moreton Bay, A. Cunningham, F. v. Mueller.

Widely spread over tropical Africa and Asia.

Var. *propinquum*, Bail. *Syn. Ql.* Fl. 711; Litho. Ferns Ql. 128. This is a pubescent form, although closely resembling the type will not like that be found in or near swamps. It is mostly met with on rich forest land—*Nephrodium propinquum*, R. Br.

Hab.: Nerang Creek, H. Schneider.

5. *A. pteroides* (Pteris-like), Swartz.; *Syn. Filic.* 47; *Benth. Fl. Austr.* vii. 755. Nearly allied to *A. unitum*, with the same pinnatifid pinnae and venation. Fronds taller, glabrous or minutely pubescent. Pinnae membranous, usually 6 to 8 in. long and about $\frac{1}{2}$ in. broad, mostly petiolate, the lower ones scarcely smaller, the lobes reaching about $\frac{3}{4}$ way to the midrib. Sori rather large, in close marginal rows. Indusium orbicular-reniform.—Bail. Litho. Ferns Ql. 129; *Nephrodium pteroides*, J. Sm.; Hook. and Bak. *Syn. Filic.* 289.

Hab.: Rockingham Bay and other tropical localities.

Spread over tropical Asia and the Pacific Islands.

Var. *terminans*, Bail. Bot. Bull. 5. Rhizome creeping. Fronds tall. The veins more or less covered by a short, somewhat golden-coloured hoary pubescent and simple white hairs. Pinnae membranous, about 8 or 12 in. long and 1 in. broad, the apex finely acuminate, the terminal one deeply pinnatifid with numerous narrow lobes, sinuses open and much nearer the costule than the apex of lobes. Sori very few, often only 3 or 4, and confined to the apex of segment. Indusium orbicular-reniform.—Bail. Litho. Ferns Ql. 129; *Nephrodium terminans*, Hook. Spec. Filic. iv. 73.

Hab.: Tropical Queensland.

6. *A. molle* (soft), Swartz.; *Syn. Filic.* 49; *Benth. Fl. Austr.* vii. 756. "Binung," Bundaberg, *Keys*. Rhizome short and thick. Fronds 1 to 2 ft. long, on a stipes often as long, simply pinnate, glabrous or hirsute, usually of a light

green. Pinnæ lanceolate, the longer ones 3 to 6in. long or even more, often acuminate, regularly pinnatifid, the lobes sometimes short sometimes reaching above half-way to the midrib, the pinnæ truncate at the base, mostly sessile, the lower ones gradually smaller and more distant. Veins pinnate in each lobe and prominent, the branches or veinlets of adjoining lobes united in a vein tending to the sinus. Sori usually in a row about halfway between the midrib of the lobe and the margin. Indusium orbicular-reniform, soon disappearing.—F. v. M. *Fragm.* v. 185; *Bail. Litho. Ferns* Ql. 180; *Polypodium molle*, Jacq. *ic. Rar.* t. 640; *Nephrodium molle*, R. Br. *Prod.* 149; *Hook. Spec. Filic.* iv. 67, *Syn. Filic.* 293; *Bedd. Ferns S. Ind.* t. 84.

Hab.: Johnstone River, *Gulliver*; York Peninsula, *N. Taylor*; Rockingham Bay, *W. Hill, Dallachy*; Bowen, *Woolfs*; Brown River, *M'Gillivray*; Port Denison and Daintree River, *Fitzalan*; Rockhampton, *Boeman, O'Shanery*; Moreton Bay, *F. v. Mueller, C. Stuart*; a very common species.

Var. didymosorus. Sori 1 or 2 to each lobe and only at the junction of the lowest veinlets of adjoining lobes.—*Bail. Litho. Ferns*, Ql. 131; *Nephrodium didymosorum*, *Bedd. Ferns Brit. Ind.* t. 200.

Hab.: Rockingham Bay, *Dallachy*.

Var. decurtatum, *Bail. Bot. Bull.* 5 and *Litho. Ferns* Ql. 129. A peculiar growth found near the pumping station on Stradbroke Island; most of the plants observed produced fronds with very blunt pinnæ, as shown on plate, but here and there were noticed a frond or so of the ordinary form.

The species is spread over tropical Asia and Africa and the Pacific Islands.

7. ***A. truncatum*** (truncate), *Gaudich. in Freyc. Voy. Bot.* 332, t. 10; *Benth. Fl. Austr.* vii. 756. Very closely allied to *A. molle*, and difficult to distinguish by any positive characters. Usually a much larger plant, the fronds often 4 or 8ft. high and sometimes more, the larger pinnæ 6in. to 1ft. long, the lobes more obtuse, often quite truncate.—*Bail. Litho. Ferns* Ql. 133; *Nephrodium truncatum*, *Presl*; *Hook. and Bak. Syn. Filic.* 294; *N. abruptum*, *Presl*; *Hook. Spec. Filic.* iv. 77, t. 241; *Bedd. Ferns S. Ind.* t. 86; *Aspidium extensum*, *F. v. M. Fragm.* v. 135, but scarcely of *Blume*.

Hab.: Nerang Creek, *H. Schneider*.

Also in tropical Asia and the Pacific Islands.

8. ***A. confuens*** (confluent), *Metten. in Linnæa*, xxxvi. 125; *Benth. Fl. Austr.* vii. 757. Fronds 1 to 8ft. long or rather more, deeply pinnatifid or pinnate at the base. Segments lanceolate, often numerous, the upper ones 2 to 6in. long, pinnately toothed or lobed, confluent on the broadly-winged rhachis, the intermediate ones 6 to 10in. long, deeply pinnatifid and decurrent on the rhachis, the lowest pair quite free at the base, pinnatifid with long lanceolate lobes, of which the outer ones are again pinnatifid, all membranous. Veins copiously netted. Sori scattered, either on short veinlets free in the areoles or on the anastomosing veinlets. Indusium when perfect rather large, orbicular, peltate or on the same frond attached by a deep sinus.—*Bail. Litho. Ferns* Ql. 134; *Nephrodium confuens*, *F. v. M.*; *Hook. and Bak. Syn. Filic.* 504; *A. melanocaulon*, *F. v. M. Fragm.* v. 133, not of *Blume*; *Sagenia melanocaulon*, *Bail. Ql. Ferns*, 47.

Hab.: Johnstone River, *Gulliver*; Rockingham Bay, *Dallachy*; Daintree River, *Fitzalan*; York Peninsula, *N. Taylor*; common in tropical scrubs.

9. ***A. aculeatum*** (prickly), *Swartz*; *Hook. Spec. Filic.* iv. 113, *Brit. Ferns*, t. 10 to 12, *Syn. Filic.* 252; *Benth. Fl. Austr.* vii. 757. Lady Fern. Rhizome short and thick. Fronds 1 to 2ft. high, twice pinnate, the lower part of the stipes and the whole frond when young very shaggy, with dark-brown scarios scales mixed with hairlike ones. Primary pinnæ lanceolate in outline, 1½ to 4in. long, the lower ones decreasing in length; pinnules ovate-lanceolate, curved, 8 to 6 lines long, prickly-toothed, with a prominent angle or lobe on the upper or

inner side. Veins forked, diverging from the midrib. Sori usually 6 to 8 on each pinnule.—F. v. M. *Fragm.* v. 184; Sieb. *Syn. Filic.* n. 104; Bail. *Litho. Ferns* Ql. 185; *A. proliferum*, R. Br. *Prod.* 147; *Polystichum vestitum*, Presl.; Hook. f. *Fl. Tasm.* ii. 148.

Hab.: Southern localities.

In most temperate and subtropical regions of the globe.

10. ***A. aristatum*** (awned), Swartz; Hook. *Spec. Filic.* iv. 27; *Syn. Filic.* 255; Benth. *Fl. Austr.* vii. 757. Fronds 1 to 2 ft. high, broadly ovate-triangular in outline, twice pinnate or the lower pinnae again pinnate at the base, firm but thin, light green and glossy, the stipes scaly-hairy at the base. Pinnules or segments very obliquely oblong or lanceolate, $\frac{1}{2}$ to 1 in. long, narrowed or cuneate at the base, bordered at the end by a few teeth ending in bristle-like points. Veins forked, diverging from the midrib. Sori small, not numerous, loosely arranged in 2 rows. Indusium small, orbicular-reniform.—F. v. M. *Fragm.* v. 184; Bail. *Litho. Ferns*, Ql. 186; *Lastrea aristata*, T. Moore; Bail. *Ql. Ferns*, 49.

Hab.: Rockingham Bay, *Dallachy*; Port Denison, *Fitzalan*; Nerang, *Schneider*.

Spread over Eastern Asia from the Himalayas to Japan, in the Pacific Islands and South Africa.

11. ***A. decompositum*** (much divided), Spreng. *Syst.* iv. 109; Benth. *Fl. Austr.* v. 758. Rhizome short and thick or longer and creeping. Fronds glabrous or the rachis and primary nerves pubescent, very variable in size and outline, the smaller ones ovate-lanceolate, 6 in. to near 1 ft. long, on a stipes often nearly as long, pinnate with deeply pinnatifid pinnae, the larger ones twice as long, much broader in proportion and thrice pinnate. Primary and secondary pinnae ending in a narrow pinnatifid apex. Pinnules or segments lanceolate, 2 to 3 lines broad, pinnately toothed or lobed, the teeth acute or mucronate and the margin of the lobes usually nerve-like. Veins pinnate, more or less divided according to the division of the pinnules. Sori usually 1 or 2 to each principal lobe not very far from the midrib. Indusium orbicular-reniform often concealed as the sorus enlarges.—F. v. M. *Fragm.* v. 186; Bail. *Litho. Ferns* Ql. 187; *Nephrodium decompositum*, R. Br. *Prod.* 149; Hook. *Spec. Filic.* iv. 146, *Syn. Filic.* 281; Hook. f. *Fl. Tasm.* ii. 149, *Fl. N. Zel.* t. 79; *Lastrea decomposita*, Presl.; Bail. *Queensl. Ferns*, 49.

Hab.: Broadsound, *R. Brown*; Rockingham and Cleveland Bay, *Dallachy*; Bowen, *Woolfe*; Brisbane River, Moreton Bay, *Fraser*, *C. Stuart*; Rockhampton and other southern localities, *Thozet* and others.

Also in New Zealand and the Pacific Islands.

12. ***A. acuminatum*** (acuminate), var. *villosum*, Bail. *3rd Suppl. Syn. Ql. Fl.* 98. Rhizome shortly creeping, more or less covered at the end with broad, brown scales; stipes slender, 3 to 6 in. long, clothed with short soft hairs, and a few scales at the base. Fronds somewhat deltoid, 8 to 7 in. long and broad; rachis and midrib densely clothed with rather long soft white hairs. Sori scanty on the few fronds gathered.—Bail. *Litho. Ferns* Ql. 188.

Hab.: South Peak, Bellenden-Ker.

13. ***A. tenerum*** (tender), Spreng. *Syst.* iv. 109; Benth. *Fl. Austr.* vii. 759. Very near *A. decompositum* and varies like it in the fronds twice or thrice pinnate, with the lobes or teeth acute, but the pinnules and segments are more regular and more regularly pinnately-lobed or dentate, the parallel branches of the veins much more numerous, and the sori are close to the margin at a distance from the midrib.—Bail. *Litho. Ferns* Ql. 189; *Nephrodium tenerum*, R. Br. *Prod.* 149.

Hab.: Keppel Bay, *R. Brown*; Mount Elliott, *Fitzalan*; Mount Mueller, *Dallachy*; Rockhampton, *Bowman*; Moreton Bay, *C. Stuart*.

80. **POLYPODIUM**, Linn.

(From *polys*, many, *pous*, a foot, the rhizome when destitute of the fronds having the appearance of some kind of sea-polypus.

Rhizome creeping in all the Australian species, with small brown scales with a broad adnate base and more or less acute or subulate points. Fronds simple pinnate or compound. Sori orbicular, very rarely oblong, variously dispersed over the under surface, without any indusium.

A large genus distributed over every part of the globe except the coldest or high alpine regions.

In the Australian species, where the frond is small, the creeping rhizomes usually form dense matted patches on rocks and trunks of trees, in the larger species the rhizome often creeps up the trunks of trees to a great length. In most species the stipes is more or less distinctly articulate on the rhizome.—*Benth.*

SERIES I. *Dianeura*.—Veins diverging from the midrib forked or branched, the branches not anastomosing. Sori terminating or near the end of one of the branches.

***Eupolypodium*.** Fronds coriaceous, entire or pinnatifid, glabrous or ciliate-hairy, the venation usually concealed in the thick texture of the frond.

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|--|-----------------------------|
| Fronds entire, glabrous. Sori oblong or linear | 1. <i>P. australe</i> . |
| Fronds entire, ciliate with long brown hairs | 2. <i>P. Hookeri</i> . |
| Fronds entire, clothed with nearly white hairs | 3. <i>P. albosetosum</i> . |
| Fronds pinnatifid with short lanceolate entire lobes | 4. <i>P. blechnoides</i> . |
| Fronds simply pinnate, pinnae entire, broadly adnate at the base | 5. <i>P. fuscopilosum</i> . |

(No corresponding *Aspidia*.)

Sub-genus ***Arthropteris***. Fronds pinnate, with numerous undivided pinnae articulate on the rachis 6. *P. tenellum*.

(See sect. *Nephrolepis* of *Aspidium*.)

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|---|----------------------------|
| Sub-genus <i>Phegopteris</i> . Fronds decomposed, twice or thrice pinnate with pinnatifid pinnules | 7. <i>P. punctatum</i> . |
| Pinnae and pinnules ciliate with white hairs or bristles | 8. <i>P. pallidum</i> . |
| Fronds glossy, somewhat ovate in outline, 6 to 18 in. long, scales at base of stipes dark-brown | 9. <i>P. aspidioides</i> . |

(See sect. *Lastrea* of *Aspidium*.)

SERIES II. *Syneura*.—Branches of parallel primary veins uniting but not reticulate.

Sub-genus ***Goniopteris***. Fronds pinnate. Pinnae broadly crenate or equally pinnatifid, with a pinnate vein leading to each lobe, the veinlets under adjoining lobes uniting in an intermediate vein leading to the sinus.

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|---|----------------------------|
| Fronds spreading, proliferous. Pinnae 1 to 4 in. long. Sori chiefly near the margin | 10. <i>P. proliferum</i> . |
| Fronds tall, erect. Pinnae 6 to 12 in. Sori in 2 parallel rows between each 2 primary veins | 11. <i>P. urophyllum</i> . |
| Fronds erect, densely villous | 12. <i>P. Hillii</i> . |

(See also sect. *Nephrodium* of *Aspidium*.)

Fronds and venation of *Goniopteris* except that the branches of the primary veins anastomose but do not form a parallel intermediate vein 13. *P. pacilophlebium*.

SERIES III. *Dictyoneura*.—Venation reticulate between more or less distinctly parallel primary veins, with a small free usually clavate veinlet in a few or in many of the areolae. Sori on the free or on the connecting veinlets.

Sub-genus ***Niphobolus***. Fronds coriaceous, entire or rarely forked, covered with stellate hairs or scales, the fertile ones narrow, the barren often short and broad. Venation concealed in the thick texture.

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| Fronds under 1 in. long. Sori rather large, irregularly placed often contiguous. Scales very dense | 14. <i>P. serpens</i> . |
|--|-------------------------|

- Fronde 3 to 12 in. long. Sori large, oval, in a single row on each side of the midrib. Scales small. 15. *P. confluens*.
 Fronds 6 in. to 2 ft. long. Sori small, very numerous, and densely crowded in many rows. Scales minute 16. *P. acrostichoides*.

Sub-genera **Goniophlebium** and **Phymatodes**. Fronds without stellate scales. Sori large and distant in a single row (or 2 in *P. phymatodes*) on each side of the midrib, each sorus in a cavity forming a pustule on the upper surface (except *P. simplicissimum*.)

- Fronde long and narrow, entire or crenate.
 Fronds coriaceous smooth and shining, the venation concealed in the texture 17. *P. attenuatum*.
 Epiphyte. Fronds linear-lanceolate, 12 to 13 in. long, about 1 in. broad, decurrent to a very short stipes 18. *P. superficiale*,
 var. *australiense*.
 Fronds rigidly membranous, the larger veins conspicuous 19. *P. simplicissimum*.
 Fronds deeply pinnatifid with long segments confluent in a broad wing to the rhachis.
 Fronds usually above 1½ ft. high.
 Segments membranous, showing the veins 6 in. to 1 ft. long, 1 to 1½ in. broad, with narrow points 20. *P. nigrescens*.
 Segments smooth, the veins inconspicuous, 4 to 8 in. long, ½ to 1½ in. broad 21. *P. phymatodes*.
 Fronds usually under 1½ ft. high.
 Segments rather firm, showing the primary veins, 3 to 6 in. long, 4 to 8 lines broad 22. *P. pustulatum*.
 Segments membranous, smooth, the veins scarcely conspicuous, rarely above 3 in. long 23. *P. scandens*.
 Fronds pinnate, the pinnae articulate on the rhachis at least when fertile.
 Pinnae membranous, 6 to 8 in. long, ½ to 1 in. broad, cuneate at the base 24. *P. verrucosum*.
 Pinnae 3 to 6 in. long, 3 to 5 lines broad, serrate, truncate or articulate on the base 25. *P. subauriculatum*.
 Pinnae rigid, 3 to 9 in. long, 3 to 9 lines broad, cuneate at the base. Barren fronds sessile, short and broad 26. *P. rigidulum*.
 Fronds without stellate scales. Sori irregularly scattered or in several rows, with a very slight or no corresponding prominence on the upper surface.
 Fronds entire, long and broad. Sori numerous and small 27. *P. irioides*.
 Fronds deeply pinnatifid with long segments confluent in a broad wing to the rhachis. Sori large, in about 2 rows.
 Venation inconspicuous. Single free veinlets in several areolae.
 Receptacle prominent on the upper surface 21. *P. phymatodes*.
 Fronds deeply pinnatifid. Sori numerous and small. Barren fronds sessile, short and broad 28. *P. quercifolium*.

(See also sect. *Sagenia* in *Aspidium*.)

1. ***P. australe*** (southern), Metten.; Hook. *Spec. Filic.* iv. 167, *Syn. Filic.* 322; Benth. *Fl. Austr.* vii. 762. Fronds entire, coriaceous, glabrous, linear or oblanceolate, usually 3 or 4 in. long but sometimes reduced to about ½ in., or when very luxuriant above 6 in., obtuse, contracted into a short stipes. Veins, diverging from the midrib, once or twice forked, free, but concealed in the thick substance of the frond. Sori oblong or linear almost as in *Grammitis*, rather large, oblique and parallel in a single row on each side of the midrib, and when old often confluent, covering nearly the whole surface.—F. v. M. *Fragm.* v. 127; Bail. *Litho. Ferns* Ql. 140, northern and southern forms; *Grammitis australis*, R. Br. *Prod.* 146; Hook. f. *Fl. Tasm.* ii. 151; Sieb. *Fl. Mixt.* n. 235; G. Billardieri, Willd. *Spec.* v. 139; *Polypodium diminutum*, Bak. *Syn. Fil.* 507.

Hab.: Northern and southern ranges.

Also in New Zealand and the extreme south of America.

2. **P. Hookeri** (after Sir J. D. Hooker), *Brackenr.*; *Hook. Spec. Filic.* iv. 171, *Syn. Filic.* 819; *Benth. Fl. Austr.* vii. 768: Fronds entire linear or lanceolate as in *P. australe* and sometimes as small, but often 6 to 8 in. long, and not quite so coriaceous, tapering into a very short stipes and always fringed and sprinkled with long spreading dark hairs. Veins rather more divided than in *P. australe*. Sori orbicular oval or shortly oblong, rather large, in a single row on each side of the midrib.—*Bail. Litho. Ferns Ql.* 140; *P. setigerum*, *Hook. and Arn. Bot. Beech.* 108, t. 21; but scarcely of Blume.

Hab.: Northern and southern ranges.

Also in the Philippines and the Sandwich Islands.

3. **P. albosetosum** (bristles white), *Bail. 3rd Suppl. Syn. Ql. Fl.* 94. Rhizome erect or very shortly creeping, the blunt apex covered by broadly ovate, imbricated light-brown scales. Fronds tufted, all under 2 in. long and 8 lines broad, tapering from a broad obtuse end to very short stipites, which seldom if ever exceed 3 lines in length, hairy throughout with light-coloured fine hairs, those of the stipes short and strigose, those of the frond soft and rather long, and all of a very light colour, nearly white; veins simple or once forked; sori orbicular, with bristle-like white hairs amongst the spore-cases, at the apex of fork of the vein and forming a single row on each side of the costa on the upper portion of the frond.—*Bail. Litho. Ferns Ql.* 140.

Hab.: On rocks and stems of trees, Bellenden-Ker, at an altitude of from 4,000 to 5,000ft.

This small fern is closely allied to *P. Hookeri*, but separated by the form of the scales and colour of the hairs, which latter do not form decided ciliæ to the margins.

4. **P. blechnoides** (Blechnum-like), *Hook. Spec. Filic.* iv. 180, *Syn. Filic.* 831; *Benth. Fl. Austr.* vii. 768. Fronds 2 to 4 in. long, coriaceous, deeply pinnatifid. Segments lanceolate almost reaching the rhachis, but dilated and shortly confluent at the base, the larger ones in the middle of the frond 3 to 5 lines long, the lower ones shorter and broader, contracted into a short narrowly-winged stipes. Veins pinnate in each lobe. Sori at the end of the veinlets, orbicular, 3 to 5 pairs in each lobe, forming 2 rows nearer to the margin than to the midrib.—*Grammitis blechnoides*, *Grev. in Ann. Nat. Hist. ser. 2, i.* 328, t. 17; *Polypodium contiguum*, *Brackenr.*; *F. v. M. Fragm. v.* 127.

Hab.: Ranges of the north.

Also in the Pacific islands.

5. **P. fuscopilosum** (hairs brown), *Baker et F. v. M. Brit. Journ. Bot.* xxv. 168. Rootstock short-creeping, hypogæous. Fronds contiguous, nearly sessile, lanceolate, simply pinnate, moderately firm in texture, erect, elastic, green and copiously clothed with short brown hairs on both surfaces, 4 to 5 in. long, $\frac{1}{2}$ to $\frac{3}{4}$ in. broad at the middle, narrowed gradually to both ends. Pinnæ very numerous, broadly adnate at the base, contiguous, entire, lanceolate, subobtusely, the central ones $\frac{1}{2}$ to $\frac{3}{4}$ in. long, 1 to $1\frac{1}{2}$ line broad. Veins distinctly visible; costa zigzag; veinlets few, erecto-patent, simple. Sori globose, medial, slightly immersed.—*Baker l.c.*; *Bail. Litho. Ferns Ql.* 14.

Hab.: Bellenden-Ker, at 4,000 to 5,000ft. on rocks and tree-trunks, *Sayers and Davidson* (*F. v. M.*)

6. **P. tenellum** (tender), *Forst.*; *Hook. Spec. Filic.* iv. 217, *Syn. Filic.* 837; *Benth. Fl. Austr.* vii. 764. Fronds usually 1 to 2ft. long, glabrous, simply pinnate, the stipes articulate on the rhizome. Pinnæ shortly petiolate and articulate on the rhachis, lanceolate, acuminate, often falcate, undulate-crenate, unequal at the base, 2 to 4 in. long, membranous. Veins pinnate with forked branches, one fork bearing the sorus, the other again forked. Sori orbicular,

small, not very close, forming a row very near the margin as in the section *Nephrolepis* of *Aspidium*.—R. Br. Prod. 147; Bail. Litho. Ferns Ql. 142; *Arthropteris tenella*, J. Sm. in Hook. f. Fl. N. Zel. t. 82.

Hab.: Brisbane River, Moreton Bay, *F. v. Mueller*, *A. Cunningham* and others; Mount Dryander, *Fitzalan*.

Also in New Zealand, Norfolk Island and New Caledonia.

7. ***P. punctatum*** (dotted), *Thunb. Fl. Jap.* 387; *Benth. Fl. Austr.* vii. 764. Frond 1 to 4ft. long on a stipes of 1ft. or more, broad in outline, twice or thrice pinnate as in the section *Lastrea* of *Aspidium*. Pinnules oblong, $\frac{1}{2}$ to 1 $\frac{1}{2}$ in. long, membranous or rather rigid when in full fruit, deeply pinnatifid with dentate segments. Veins in each pinnule or segment pinnate with free forked branches. Sori orbicular, in 2 rows on the smaller pinnules or longer lobes.—Hook. and Bak. Syn. Filic. 812; Bail. Litho. Ferns Ql. 143; *P. rugosulum*, Labill. Pl. Nov. Holl. ii. 92, t. 241; R. Br. Prod. 147; Sieb. Syn. Filic. n. 109; *F. v. M. Fragm.* v. 129; *P. rugulosum*, Hook. Spec. Filic. iv. 272; Hook. f. Fl. Tasm. ii. 149; Bedd. Ferns S. Ind., t. 170.

Hab.: Rockingham Bay, *Dallachy*; Daintree River, *Fitzalan*; Brisbane River, Moreton Bay, *F. v. Mueller*. Common in southern localities.

Extends over the tropical and southern extratropical regions of the Old World, reaching northwards to Japan. It requires some care to distinguish the specimens from those of *Hypolepis tenuifolia* especially when the fructification is old, but the position of the sori on a nerve at some distance from the margin, is very different from that of *Hypolepis*, where it is strictly marginal with the recurved indusium very distinct when young.—*Benth.*

8. ***P. pallidum*** (pale), *Brack. Fil. U.S. Exped.* 18. Rhizome short, slightly creeping. Fronds 2 to 3ft., the stipes also 1 to 2ft., twice pinnate, the larger pinnæ 6 to 8in. long. Pinnules lanceolate, 1 to 1 $\frac{1}{2}$ in. long on the larger pinnæ, very deeply pinnatifid with numerous lanceolate lobes, 1 to 3 lines long, all more or less decurrent, ciliate on the margins as well as the principal veins and rhachis with rigid white hairs or bristles. Veins branched in each lobe but free. Sori 1 to 6 to each lobe, small and distinct with few spore-cases.—*Aspidium tenericaule*, Bail. Litho. Ferns Ql. 144; Thw. Enum. Pl. Ceyl. 393; *Benth. Fl. Austr.* vii. 759.

Hab.: 3-mile scrub near Brisbane; Nerang and Toowoomba.

9. ***P. aspidioides*** (*Aspidium*-like), *Bail. Syn. Ql. Fl.* 714. Shiny Fern. Rhizome horizontal, thin, shortly creeping. Fronds 12 to 18in. long, usually ovate-lanceolate in outline in the small forms, but more triangular-ovate in the larger ones. Stipes slender, sulcate and densely covered at or near the base with dark-brown ovate acuminate scales, bi-tripinnate, the pinnæ and pinnules much elongated at the apex, the upper surface glossy; rhachis and costules hairy. Veins pinnate, ending beyond the margin in aculeate teeth. Sori medial.—Bail. Litho. Ferns Ql. 145.

Hab.: Scrubs of the Brisbane River and other southern localities.

Var. *tropica*. Fronds less divided, marginal teeth sometimes wanting, the obtuse pinnules only crenulated, the whole frond covered with a soft reddish pubescence.—Bail. Litho. Ferns Ql. 146.

Hab.: The tropical scrubs.

10. ***P. proliferum*** (proliferous), *Presl; Hook. Spec. Filic.* v. 18, *Syn. Filic.* 815; *Benth. Fl. Austr.* vii. 765. Fronds usually weak and spreading and often proliferous at the end, 1 to 2ft. long when full grown, but some in full fruit much smaller, pinnate. Pinnæ lanceolate, 1 to 4in. long, shortly and regularly pinnatifid with obtuse rounded lobes sometimes almost reduced to crenatures, broadly truncate at the base. Veins pinnate to each lobe, the branches or veinlets of adjoining lobes uniting in a vein leading to the sinus as in the section *Nephrodium* of *Aspidium*. Sori in 2 rows to each lobe, sometimes only at the

end sometimes reaching almost to the midrib of the pinna.—F. v. M. *Fragm.* v. 128; *Bail. Litho. Ferns* Ql. 147; *Meniscium proliferum*, Hook. 2nd Cent. Ferns t. 15; *Goniopteris proliferata*, Presl; *Bail. Queensl. Ferns*, 40.

Hab.: Mount Mueller, Rockingham Bay, *Dallachy*; Mount Elliott and Port Denison, *Fitzalan*; Palmer River, *Hann's Expedition*; Rockhampton, *O'Shanesy*; Brisbane River, *W. Hill*; Coomera and Upper Nerang, *H. Schneider*.

Dispersed over tropical Asia and Africa and in New Caledonia.

11. ***P. urophyllum*** (leaf tailed), *Wall.*; *Hook. Spec. Filic.* v. 9, *Syn. Filic.* 314; *Benth. Fl. Austr.* vii. 765. Frond 2 to 4 ft. long on a stipes often nearly as long, pinnate, more or less glandular-pubescent underneath. Pinnæ 6 in. to nearly 1 ft. long, 1 to 2 in. broad, acuminate, regularly and broadly crenate or shortly lobed, rounded or truncate at the base. Primary veins leading to the lobes numerous and parallel, pinnate, the branches or venules uniting in an intermediate vein leading to the sinus. Sori orbicular in 2 regular rows between each 2 primary veins, extending from the midrib of the pinna to the margin.—*Bail. Litho. Ferns* Ql. 148; *Goniopteris urophylla*, Presl; *Bail. Queensl. Ferns* 39; *G. lineata*, Bedd. *Ferns Brit. Ind.* t. 4; *Meniscium* or *Polypodium Kennedyi*, F. v. M. *Fragm.* iv. 165; *Goniopteris Kennedyi*, F. v. M.; *Bail. Queensl. Ferns* 41.

Hab.: Rockingham Bay, *W. Hill*, *Dallachy*; Daintree River, *Fitzalan*; York Peninsula, *N. Taylor*.

Spread over tropical Asia and the Pacific Islands.

12. ***P. Hillii*** (after W. Hill), *Bak. Syn. Filic.* 505; *Benth. Fl. Austr.* vii. 766. Rhizome creeping. Frond 1½ ft. high including the stipes, pinnate, densely and softly hirsute all over. Pinnæ 9, the 8 terminal ones (exceptionally) small, the others oblong, 4 to 6 in. long, 1½ to 2 in. broad, pinnately crenate or shortly lobed but less regularly so than in the preceding species. Parallel primary pinnate veins leading to the lobes, the branches or venules uniting in an intermediate vein reaching the sinus. Sori as in *P. urophyllum*, in 2 rows between each 2 primary veins, reaching from the midrib to the margin but not close.—*Bail. Litho. Ferns* Ql. 149; *Goniopteris Ghiesbreghtii*, *Bail. Queensl. Ferns* 40, not of *Linden*.

Hab.: Between Cleveland Bay and Rockingham Bay, *W. Hill*; and other tropical localities.

13. ***P. pœcilophlebium*** (veins various), *Hook. Spec. Filic.* v. 14, *Syn. Filic.* 314; *Benth. Fl. Austr.* vii. 766. Fronds usually about 1 ft. long on a stipes at least half as long, pinnate, glabrous. Pinnæ lanceolate, acuminate, 4 to 8 in. long, 1 to 1½ in. broad, shortly contracted into a petiole. Primary parallel veins numerous and prominent, pinnate, the branches or veinlets oblique, more or less anastomosing with those of the adjoining primary vein, but not forming a straight intermediate vein as in the preceding species. Sori rather small, in two irregular rows between each 2 primary veins.—*Bail. Litho. Ferns* Ql. 150; *Goniopteris pœcilophlebia*, *Bail. Ql. Ferns*, 40.

Hab.: Endeavour River and Fitzroy Island, *A. Cunningham*; Dunk Island, *M. Gillivray*, Rockingham Bay, *W. Hill*, *Dallachy*; Mount Elliott, Daintree River and Port Denison *Fitzalan*; York Peninsula, *N. Taylor*.

14. ***P. serpens*** (creeping), *Forst.*; *Hook. and Bak. Syn. Filic.* 349; *Benth. Fl. Austr.* vii. 767. Fronds small but growing in large matted patches, entire, coriaceous, obtuse, contracted into a short or rather long stipes, densely covered on the lower surface and more loosely on the upper one with stellate hairs or scales, the barren ones obovate or oblong, from under ½ in. to 1½ in. long, the fertile ones linear or oblong-linear, ¾ to 2 in. long. Venation reticulate, concealed in the thick texture of the frond, and the dry frond even rugose with indented lines not connected with the veins. Sori irregularly crowded in the

upper end or nearly over the whole frond, often confluent when old.—Sieb. Syn. Filic. n. 95; F. v. M. Fragm. v. 129; Bail. Litho. Ferns Ql. 151; *P. rupestre*, R. Br. Prod. 146; Hook. Spec. Filic. v. 46; *Niphobolus rupestris*, Kaulf.; Hook. and Grev. Ic. Filic. t. 93; *Polypodium confluens*, Hook. Spec. Filic. v. 46, Syn. Filic. 849, not of R. Br.; *Niphobolus confluens*, Bail. Ql. Ferns, 48.

Hab.: Edgecombe Bay and Rockingham Bay, *Dallachy*; Mount Elliott, *Fitzalan*; Brisbane River, Moreton Bay, *A. Cunningham*, *F. v. Mueller* and others; Rockhampton, *Thozet*.
Also in New Zealand and the South Pacific Islands.

15. ***P. confluens*** (confluent), *R. Br. Prod.* 146; *Benth. Fl. Austr.* vii. 767. Frond entire, coriaceous, obtuse or rarely acuminate, contracted into the stipes, covered with stellate hairs or scales usually very small and often deciduous making the fronds appear glabrous, but sometimes almost as abundant as in *P. serpens*, the barren ones oblong or obovate-oblong, 1 to 2 in. long, the fertile ones linear or lanceolate varying from 8 or 4 in. to nearly 1 ft. long. Veins reticulate but concealed in the texture as in *P. serpens*. Sori large, oval or oblong, in a single row on each side of the midrib, often confluent when old.—Bail. Litho. Ferns Ql. 151; *P. glabrum*, Metten. Polypod. 123, Hook. and Bak. Syn. Filic. 856; *P. acrostichoides*, Sieb. Syn. Filic. 94, not of Forst.

Hab.: Burnett River, *F. v. Mueller*; Brisbane River, Moreton Bay, *A. Cunningham*, *F. v. Mueller*; Rockhampton, *Bowman*, *O'Shanesy*, *Thozet*.

Var. *lobatum*. Fronds deeply and variously lobed, and larger than in the normal form.—Bail. Litho. Ferns Ql. 153.

Hab.: On rocks Helidon Waterfalls.
Also in Norfolk Island and New Caledonia.

16. ***P. acrostichoides*** (*Acrostichum*-like), *Forst.*; *Hook. and Bak. Syn. Filic.* 850; *Benth. Fl. Austr.* vii. 767. Frond lanceolate, entire or rarely forked at the apex, 6 in. to 2 ft. long, contracted into a sharp stipes, coriaceous with the concealed reticulate venation of *P. serpens*, but the stellate hairs or scales on the under surface very minute and the upper surface usually glabrous. Sori in the upper part of the frond distinct, but very small and exceedingly numerous crowded in several rows between the midrib and the margin.—*R. Br. Prod.* 146; Bail. Litho. Ferns Ql. 158; *Niphobolus acrostichoides*, *Bedd. Ferns Brit. Ind.* t. 81; *N. puberulus*, *Blume, Fl. Jav. Filic.* 57, t. 23.

Hab.: Endeavour River, *Banks and Solander*; Cape York, *W. Hill*, *Daemel*; Cape York Peninsula, *N. Taylor*; Rockingham Bay, *W. Hill*, *Dallachy*; Fitzroy Island, *A. Cunningham*, *Walter*; Daintree River, *Fitzalan*.

Also in Ceylon, the Malayan Archipelago and the Pacific Islands.

17. ***P. attenuatum*** (attenuated), *R. Br. Prod.* 146; *Benth. Fl. Austr.* vii. 768. Frond entire, coriaceous, linear-lanceolate or shortly acuminate, 6 to 18 in. long, $\frac{1}{4}$ to $\frac{1}{2}$ in. broad, contracted into a short stipes, glabrous, the reticulate venation concealed in the thick texture. Sori large, oval-oblong, inserted in cavities forming protuberances on the upper surface, rather distant in a single row on each side of the midrib about half-way between it and the margin.—Hook. Spec. Filic. v. 58, *Gard. Ferns*, t. 30; Sieb. Spec. Filic. n. 93, *Fl. Mixt.* n. 237; Bail. Litho. Ferns Ql. 154; *Dictyopteris attenuata*, *Presl*; Bail. Ql. Ferns, 41; *Polypodium Brownianum*, *Spreng. Syst.* v. 554 (Index); *F. v. M. Fragm.* v. 128; *P. Brownii*, *Desv. in Ann. Soc. Linn. Par.* vi. 217; Hook. and Bak. Syn. Filic. 855.

Hab.: In both southern and northern scrubs.

Brown's name was rejected on account of the *P. attenuatum*, Humb. and Bonpl. published by Willdenow the same year (1810), but that species has been correctly referred by Griseb. to the *P. neriiifolium*, Swartz, and the name *attenuatum* may therefore be retained for Brown's plant.—*Benth.*

Also in the South Pacific Islands.

18. **P. superficiale** (superficial), *Bl. var. australiense*, *Bail. Bot. Bull.* iv. Rhizome said to be creeping over or along the branches of growing trees, from the short curved base of the stipes it is probable that the frond attached to the lower or under side of the rhizome. Frond linear-lanceolate, 12 or 18 in. long, about lin. broad in the centre, decurrent upon the stipes almost to the base, the apex more or less acuminate, texture firm, costa prominent, no distinct costules, areolæ fine, irregular, with free veinlets. Sori copious, scattered irregularly, only on the upper half of the frond.—*Bail. Litho. Ferns* Ql. 155.

Hab.: Atherton, near Herberton, *C. J. Wild.*

This plant would seem to differ from the normal form in the lamina of the frond being decurrent to the base or to a stipes of only a few lines, and the sori being confined to the upper half of the frond.

19. **P. simplicissimum** (quite simple), *F. v. M. in Hook. and Bak. Syn. Filic.* 513; *Benth. Fl. Austr.* vii. 768. Rhizome slender creeping up trees and over rocks. Frond lanceolate, acuminate, entire or slightly forked at the apex and sometimes crenate, 4 to 10 in. long, tapering into a short or long stipes, rather thin, glabrous, prominently penniveined with intermediate reticulations and free veinlets in the areoles. Sori rather large, orbicular, in a single row on each side of the midrib halfway between it and the margin, the receptacle scarcely excavated and obscurely or not at all prominent on the upper surface.—*P. lanceola*, *F. v. M. Fragm.* vii. 120; *Bail. Litho. Ferns* Ql. 156; *Pleopeltis lanceola*, *Bail. Ql. Ferns* 45.

Hab.: Tropical scrubs on mountain ranges.

20. **P. nigrescens** (blackish), *Blume, Fl. Jav. Filic.* 161, t. 70; *Benth. Fl. Austr.* vii. 769. Frond 2 or 3 ft. long on a stipes of 1 ft. or more, glabrous, deeply pinnatifid. Pinnæ lanceolate, acuminate with a narrow point, membranous, 6 in. to 1 ft. long, 1 to 1½ in. broad, confluent at the base in a broad wing to the rhachis, the main veins very distinct, reticulate between them with numerous free veinlets in the areoles. Sori large in the centre of the larger areoles, distant in a single row on each side of the midrib at some distance from it, the receptacles deeply excavated and very prominent on the upper surface.—*Hook. Spec. Filic.* v. 81, *Syn. Filic.* 864; *Bail. Litho. Ferns* Ql. 157.

Hab.: Daintree River and other northern scrubs.

Spread over East India, the Malayan Peninsula and Pacific Islands.

21. **P. phymatodes** (warted), *Linn. Hook. Spec. Filic.* v. 82, *Syn. Filic.* 864; *Benth. Fl. Austr.* vii. 769. Fronds 1, 2 or even 3 ft. long, deeply pinnatifid, very smooth and glabrous. Pinnæ lanceolate, 4 to 8 in. long, ¾ to 1½ in. broad, confluent at the base into a broadly-winged rhachis, the midrib of each pinna very prominent, with copious reticulations between the primary veins but all concealed in the smooth though not thick texture of the frond. Sori rather large, orbicular or oval, distant in about two rows or rarely in a single row on each side of the midrib at some distance from it, the receptacles slightly excavated and prominent on the upper surface.—*Bail. Litho. Ferns* Ql. 158; *Pleopeltis phymatodes*, *T. Moore*; *Bail. Ql. Ferns*, 44; *Bedd. Ferns S. Ind.* t. 178.

Hab.: Cape York, *Daemel*; Rockingham Bay, *Dallachy*, Daintree River, *Fitzalan*. Common in the tropical scrubs.

Widely spread over the tropical regions of the Old World.

22. **P. pustulatum** (blistered or pimpled), *Forst.; Carruth. in Seem. Fl. Vit.* 869, not of *Schkuhr.*; *Benth. Fl. Austr.* vii. 769. Near *P. phymatodes* but a smaller and more hardy plant. Fronds usually deeply pinnatifid, ¾ to 1½ ft. high, with few segments and sometimes entire and 4 to 8 in. long. Segments oblong-

lanceolate, mostly acuminate, 3 to 6 in. long, 4 to 8 lines broad, confluent at the base into a broad-winged rhachis, of a firm membranous texture showing on the under side of the primary veins with copious intermediate reticulations and free veinlets in the areoles. Sori orbicular, rather large, distant, in a single row on each side of the midrib at a distance from it and often near the margin. Receptacles excavated, more or less prominent on the upper surface.—Bail. Litho. Ferns Ql. 159; *P. scandens*, Labill. Pl. Nov. Holl. ii. 91, t. 240; F. v. M. Fragm. v. 128, not of Forst.; *P. Billardieri*, R. Br. Prod. 147; Hook. Spec. Filic. v. 82, Syn. Filic. 864; Sieb. Syn. Filic. n. 98; *P. diversifolium*, Willd.; Sieb. Fl. Mixt. n. 288; *Phymatodes Billardieri*, Presl.; Hook. f. Fl. Tasm. ii. 150.

Hab.: Coastal scrubs on border of N.S. Wales.

Also in New Zealand and perhaps in New Caledonia.

23. *P. scandens* (climbing), Forst. Prod. 81, not of Labill.; Benth. Fl. Austr. vii. 770. Fronds much narrower in outline than in the preceding species, usually deeply pinatifid and $\frac{3}{4}$ to $1\frac{1}{2}$ ft. long, but occasionally smaller and entire. Segments usually rather numerous, narrow lanceolate or almost linear, often falcate, obtuse or acuminate, $1\frac{1}{2}$ to 3 in. long, decurrent and confluent into a winged rhachis, of a thinner texture than the preceding species although the veins are but little prominent. Sori rather small, distant, in a single row on each side of the midrib between it and the margin, the excavated receptacles slightly prominent on the upper surface.—Bail. Litho. Ferns Ql. 160; *P. pustulatum*, Schkuhr, Filic. ii. t. 10, Hook. Spec. Filic. v. 80, Syn. Filic. 863, Sieb. Syn. Filic. n. 96, not of Forst.; *Pleopeltis pustulata*, T. Moore; Bail. Queensl. Ferns 46.

Hab.: Maroochie, Bailey; Brisbane River, Moreton Bay, Tallebudgera.

Also in New Zealand and the South Pacific Islands.

24. *P. verrucosum* (warted), Wall.; Hook. Spec. Filic. v. 81, Gard. Ferns, t. 41 Syn. Filic. 844; Benth. Fl. Austr. vii. 770. Fronds 3 or 4 or more ft. long, pinnate, glabrous. Pinnæ oblong-lanceolate, acuminate, obtusely serrulate, equally or unequally cuneate at the base, shortly petiolate or almost sessile, apparently articulate on the rhachis, 6 to 8 in. long, $\frac{1}{2}$ to 1 in. broad, membranous. Venation reticulate between the primary veins with free venules in the areoles. Sori distant in a single row on each side of the midrib and near to it, the excavated receptacles very prominent on the upper surface.—Bail. Litho. Ferns Ql. 161; *Goniophlebium verrucosum*, Bedd. Ferns Brit. Ind. t. 257.

Hab.: Rockingham Bay, Dallachy; Daintree River, Fitzalan. Common on trees and logs in the tropical scrubs.

Also in the Malayan Peninsula and Archipelago.

25. *P. subauriculatum* (alluding to the small lobes at base of pinnæ), Blume, Fl. Cav. Filic. 177, t. 83; Benth. Fl. Austr. vii. 771. Fronds 1 to 3 or more ft. long, glabrous, pinnate. Pinnæ linear-lanceolate, mostly acuminate, entire or serrulate, 3 to 6 in. long, 3 to 5 lines broad, truncate rounded or auriculate at the base, nearly sessile but somewhat articulate on the rhachis. Venation reticulate between the primary veins, with free veinlets in the areoles. Sori distant in a single row on each side of the midrib and near to it, the excavated receptacles very prominent on the upper surface.—Hook. Sp. Filic. v. 82, Syn. Filic. 844; Bail. Litho. Ferns Ql. 162; *Goniophlebium subauriculatum*, Presl.; Bail. Queensl. Ferns 42.

Hab.: Endeavour River, A. Cunningham; York Peninsula, N. Taylor; Rockingham Bay, Dallachy; Daintree River, Fitzalan; near Rockhampton, O'Shanesy, Thozet.

Spreads over tropical Asia and the Pacific Islands.

26. *P. rigidulum* (rigid), Swartz; Hook. and Bak. Syn. Filic. 368; Benth. Fl. Austr. vii. 771. Fronds of 2 kinds. Fertile ones 2 to 4ft. long, pinnate, glabrous or the rhachis slightly pubescent. Pinnæ narrow-lanceolate, usually rigid and very prominently and copiously reticulate, 3 to 9in. long, 3 to 9 lines broad, obliquely or equally cuneate at the base, often shortly petiolate, articulate on the rhachis. Sori orbicular, distant in a single row on each side of the midrib and not far from it, the excavated receptacles prominent on the upper surface. Barren fronds sessile on the rhizome, ovate or oblong, 6in. to 1ft. long, 3 or 4in. broad, shortly pinnatifid rigid and very prominently veined; the lower pinnæ of the fertile fronds are also occasionally barren and a little altered in shape or texture.—Bail. Litho. Ferns Ql. 163, 164 and 165; *P. diversifolium*, R. Br. Prod. 147; Hook. Spec. Filic. v. 98, Gard. Ferns, t. 5; F. v. M. Fragm. v. 127; *Drynaria diversifolium*, J. Sm.; Bail. Ql. Ferns 46; *Polypodium Gaudichaudii*, Blume, Fl. Jav. Filic. t. 67.

Hab.: The typical form is met with in all coastal forests and scrubs.

Also in the Malayan Archipelago and Pacific Islands.

Var. *Vidgeni*, Bail. Syn. Ql. Fl. 718. Fronds 2 to 3ft. high, pinnate; pinnæ on rather long somewhat flattened petiolules, the margins much incised, base cuneate.—Bail. Litho. Ferns Ql. 166.

Hab.: Oxley Creek, Brisbane River, J. G. Vidgen; near Herberton, C. J. Willd.

Var. *cristatum*. The points of the pinnæ are dichotomously divided into numerous segments forming tassels.

Hab.: Near Boolboonda, H. B. Fraser.

27. *P. irioides* (Iris-like), Poir.; Hook. Sp. Filic. v. 67, Syn. Filic. 360; Benth. Fl. Austr. vii. 771. Frond entire, 1 to 3ft. long, 1 to 3in. broad, coriaceous, contracted into a very short stipes. Primary parallel veins distant and usually conspicuous, with copious fine reticulations between them, the free veinlets in the areoles numerous. Sori very small and numerous, covering the whole under surface of the upper part of the frond but quite distinct from each other.—Hook. and Grev. Ic. Filic. t. 125; Blume, Fl. Jav. Filic. t. 77; Bail. Litho. Ferns Ql. 169; *Pleopeltis irioides*, T. Moore; Bedd. Ferns S. Ind. t. 178.

Hab.: Common around coastal swamps.

Spread over tropical and subtropical Asia and Africa and the Pacific Islands.

Var. *lobatum*, Bail. 1st Suppl. Syn. Ql. Fl. 64. Rhizome creeping, somewhat fleshy, when above the surface of the ground nearly glabrous, with a few dark scales. Fronds crowded, pinnatifid, undulate, 2 to 3ft. high, lobing very variable, in the centre of the frond 5 or 6 inches long and about 1in. broad, the apex very obtuse or with long acuminate points, the upper part of frond entire or with short, broad, blunt lobes, the apex very blunt or finely acuminate, the lower part of frond decurrent on to the very short stipes; the main midrib and those of the few larger lobes prominent, the primary veins slightly prominent, but the numerous reticulations of the veinlets concealed in the substance of the frond. Sori scattered, numerous, and of irregular size, oval or orbicular, very slightly sunk in the substance of the frond, and scarcely showing on the upper surface.—Bail. Litho. Ferns Ql. 170.

Hab.: Near Maryborough; Mackay, Gilbert Turner.

This handsome fern seems to connect in some measure two very different ferns, for in most respects it approaches *P. irioides*, still in some points it comes near *P. phymatodes*, while Mr. Turner's specimen has a lobing resembling the fronds of a *Platyserium*.

28. *P. quercifolium* (Quercus-leaved), Linn.; Hook. Spec. Filic. v. 96, Syn. Filic. 367; Benth. Fl. Austr. vii. 772. Fronds of two kinds. Fertile ones 2 to 3ft. long, deeply pinnatifid; segments lanceolate, 6 to 9in. long, $\frac{3}{4}$ to 1 $\frac{1}{2}$ in. broad, decurrent on the rhachis and usually confluent into a broad wing but sometimes interrupted between the lower segments, thin but usually rigid, very prominently and copiously reticulate, but the free veinlets within the areoles small and rare. Sori small, scattered, few or numerous. Barren fronds sessile, short broad and shortly pinnatifid as in *P. rigidulum*.—*P. Linnæi*, Bory, Hook. and Bak. Syn. Filic. 368; Bedd. Ferns Brit. Ind. t. 315; *Drynaria quercifolia*, J. Sm.; Bedd. Ferns S. Ind. t. 187; *D. Linnæi*, Bail. Queensl. Ferns 46.

Spread over East India and the Malayan Peninsula and the Pacific Islands.

Var. *normale*, Bail. Bot. Bull. 5. Scales of the rhizome bright glossy-brown, $\frac{1}{2}$ to $\frac{1}{4}$ in. long narrow-lanceolate, fimbriate, cordate at the base. Fronds somewhat membranous. Sori rather large, in 2 rows between and parallel with the costules, slightly immersed, and forming on the upper side of frond prominent pustules.—Bail. Litho. Ferns Ql. 167.

Hab.: Common in tropical localities.

Var. *Linnæi*, Bail. Bot. Bull. 5. Scales of the rhizome about 1 or 2 lines long, broadly-ovate with a short acumem from a peltate base. Fronds very rigid. Sori small, scattered, copious, and not showing pustules on the upper side of the frond.—Bail. Litho. Ferns Ql. 168.

Hab.: Common along the tropical coast.

On Plate 164 of Lithograms of Queensland Ferns, is represented the usual form of brown, sessile, stipular frond produced by *P. rigidulum*, *P. quercifolium* and other allied species, on Plate 165 is represented an extreme form of the same.

31. NOTHOLÆNA, R. Br.

(From *nothos*, spurious, *chlæna*, cloak; the imperfect indusium).

Rhizome tufted. Fronds usually small, once twice or thrice pinnate with small lobed segments. Veinlets forked from a central nerve or from the base of the segment. Sori small at the ends of the veinlets, almost contiguous forming an apparently continuous line within the unaltered margin, which is however more or less curved over them in a young state.

A small genus ranging over the tropical and warmer temperate regions of the New and the Old World. The genus is closely allied to *Cheilanthes*, with which it is united by F. v. Mueller and some others, but the recurved margins of the fronds can scarcely be regarded as true indusia. Some modern purists have altered Brown's name to *Nothoclæna*, but the contraction of *chlæna* into *læna*, after the example of the Romans, has been too generally sanctioned by botanists in many other cases, such as *Diplolæna*, *Eriolæna*, *Microclæna*, etc., to be here rejected.—Benth.

Fronds 1 to 3 in. high, with few membranous and glabrous undivided or 3-lobed pinnæ 1. *N. pumilio*.

Fronds lanceolate in outline, 3 to 10 in. high, once or twice pinnate with pinnatifid pinnæ.

Pinnæ densely covered underneath with more or less woolly scales 2. *N. vellea*.

Pinnæ densely covered underneath with bristly scales 3. *N. distans*.

Fronds broadly deltoid in outline, under 6 in. high, twice or thrice pinnate, sprinkled with rigid bristle-like hairs 4. *N. fragilis*.

Fronds from deltoid to lanceolate, somewhat rigid, bipinnate 5. *N. Prenticei*.

Fronds 4 to 6 in. long, bi-tripinnate, pinnæ and pinnules obtuse 6. *N. glabra*.

1. *N. pumilio* (small), R. Br. *Prod.* 146; Benth. *Fl. Austr.* vii. 778. Fronds tufted, 1 to 3 in. high, simply pinnate, with a filiform rhachis. Pinnæ few, ovate or oblong, obtuse, 3 to 5 lines long, membranous, without scales, entire or the lower ones with a short lateral lobe on one or both sides, the upper ones confluent. Veins obliquely diverging from the midrib. Sori continuous round the margin except at the base, the margin of the frond at first turned over them, but afterwards flat and not altered in consistence.—F. v. M. *Fragm.* viii. 175; Bail. Litho. Ferns Ql. 171; *N. paucijuga* Bak. *Syn. Filic.* 515.

Hab.: Endeavour River, Banks and Solander, N. Taylor.

2. *N. vellea* (woolly), R. Br. *Prod.* 146; Benth. *Fl. Austr.* vii. 778. Fronds tufted, mostly under 6 in. long but sometimes 9 or 10 in., oblong-lanceolate in outline, pinnate or bipinnate, the rhachis hirsute. Pinnæ $\frac{1}{4}$ to 1 in. long, deeply pinnatifid or pinnate, rather thick, green and hispid above, very densely woolly hirsute and often ferruginous underneath, the lobes or segments ovate or rounded, very obtuse. Sori at the ends of the forked veins forming an almost continuous narrow line round the margin.—Bail. Litho. Ferns Ql. 171; *Acrostichum velleum*, Ait.; *A. lanuginosum*, Desf. *Fl. Atl.* ii. 400, t. 256; *Notholæna lanuginosa*, Poir. *Dict. Suppl.* iv. 110; Hook. *Spec. Filic.* v. 119;

Syn. Filic. 370; *N. Brownei*, Desv. in Mem. Soc. Linn. Par. vi. 220; *Gymnogramme Brownei*, Kuhn. in Bot. Zeit. 1869, 458; *Notholæna lasiopteris*, F. v. M. in Hook. Kew Journ. vi. 106; *Cheilanthes vellea*, F. v. M. Fragm. v. 123.

Hab.: Cape York, *Daemel*; Cleveland and Rockingham Bays, *W. Hill*, *Dallachy*, *Gulliver*; Gilbert River, *Daintree*; Suttor River, *Bowman*; and other northern localities.

Also in the West Mediterranean region. The distinctions pointed out by Kuhn between the Mediterranean and Australian plant do not hold good in all the Australian specimens.

3. *N. distans* (distant), *R. Br. Prod.* 146; *Benth. Fl. Austr.* vii. 774. Very closely allied to *N. vellea*, of the same stature and general habit and not always easy to distinguish from it. The outline of the frond generally narrower, the lobes of the pinnules smaller and the indumentum not so dense, assuming on the under surface the form of bristles with little or none of the woolly hairs of *N. vellea*. Sori the same.—Hook. Spec. Filic. v. 114. Ic. Pl. t. 980, Syn. Filic. 372; Kunze in Pl. Preiss. ii. 109; Bail. Litho. Ferns Ql. 171; *Cheilanthes distans*, A. Braun; F. v. M. Fragm. v. 122.

Hab.: Percy Island, *A. Cunningham*; Logan River, *Fraser*; Brisbane River, *F. v. Mueller*; and many other localities both north and south. Found on rocks in dry situations.

Also in Norfolk Island, New Caledonia and New Zealand.

4. *N. fragilis* (fragile), Hook. Spec. Filic. v. 114, t. 287, Syn. Filic. 372; *Benth. Fl. Austr.* vii. 774. Rhizome horizontal, rather thick, scaly. Fronds broadly deltoid in outline, in some specimens 1 to 1½ in. long, on a slender stipes twice as long, in others 3 in. long and broad, with a firmer black stipes twice or thrice as long, pinnate with numerous small deeply pinnatifid pinnules, the ultimate lobes under 1 line long, each one bearing a sorus large in proportion. Partial rhachis and under side of the lobes hispid with a few rigid hairs or bristles.—Bail. Litho. Ferns Ql. 171; *Cheilanthes fragillima*, F. v. M. Fragm. v. 123.

Hab.: Thursday Island.

5. *N. Prenticei* (after Dr. Chas. Prentice), *Baker New Ferns*, 1892. Rhizome short, creeping, covered with narrow dark-brown scales, or scale-like hairs. Stipes 4 to 6 in. long, slender, almost black, shining, with a few narrow scales at the base. Fronds narrow, lanceolate, rigid, bipinnate. Pinnæ crenate, lower ones much longer than the upper ones. Sori containing small spore-cases, the edges of the pinnæ reflexed forming a narrow indusium.—Bail. Litho. Ferns Ql. 171; *Cheilanthes Prenticei*, Luess. in Bot. Centralblatt, 1882, 442.

Hab.: Thursday Island.

6. *N. glabra* (smooth), *Bracken.*; Hook. Spec. Filic. v. 115; from *Bracken. Fil. U. S. Expl. Exp.* 21. Rhizome tufted. Fronds 4 to 6 in. long on slender stipes, nearly or quite glabrous, lanceolate to ovate-lanceolate in outline, bi-tripinnate, primary and secondary divisions ovate-oblong and obtuse, the ultimate divisions or segments 2 or 3 lines long and 2 lines broad, oblong, irregularly cut into obtuse lobes. Venation obscure. Sori without any trace of indusium and following the sinuities of the frond.

Hab.: Near Brisbane, *Dr. Prentice*.

82. GRAMMITIS, Swartz.

(From *gramma*, a line; the sori being linear.)

(*Gymnogramme*, Desv.).

Rhizome short or tufted or creeping. Fronds pinnate or bipinnate, with forked and free or reticulate veins. Sori linear or oblong, without any indusium, on veins diverging from the midrib, scattered or crowded in a broad intramarginal line.

The genus is generally dispersed over the tropical and some temperate regions in both hemispheres.

Fronds simply pinnate. Pinnæ thick, entire, scaly underneath, with free veins, the sori crowded in a broad marginal line or band.

Pinnæ broadly ovate. Line of sori not 1 line broad 1. *G. Reynoldsii*.

Pinnæ ovate or oblong. Line of sori above 1 line broad 2. *G. Muellieri*.

Fronds small, bipinnate, with lobed segments. Veins free.

Pinnæ covered underneath with scaly hairs 3. *G. rutæfolia*.

Fronds simply pinnate or pinnatifid with long lanceolate pinnæ or segments. Veins netted.

Pinnæ tapering at the base, quite distinct. Sori very irregular and unequal 4. *G. pinnata*.

Segments connected by a winged rhachis.

Sori long, mostly reaching to the margin 5. *G. ampla*.

Sori short, central between margin and costa 6. *G. membranacea*.

1. ***G. Reynoldsii*** (after T. Reynolds), *F. v. M.*; *Benth. Fl. Austr.* vii. 775. Rhizome unknown. Fronds 3 to 6 in. long, simply pinnate. Pinnæ in distant pairs, broadly ovate or orbicular, obtuse, entire, about $\frac{1}{2}$ in. long, thick and densely covered on both sides with hair-like scales. Sori buried under the scales, oblong or shortly linear, transverse and distinct but closely crowded near the margin, forming a continuous line about 1 line broad.—*Notholaena Reynoldsii*, *F. v. M. Fragm.* viii. 175.

Hab.: Recorded for Queensland by *F. v. Mueller*.

2. ***G. Muellieri*** (after Baron Mueller), *Hook.*; *F. v. M. Fragm.* v. 188; *Benth. Fl. Austr.* vii. 775. Rhizome scaly, shortly creeping. Fronds 6 in. to 1 ft. long, simply pinnate, the rhachis scaly. Pinnæ in distant pairs, ovate or oblong, obtuse, entire, $\frac{1}{2}$ to 1 in. long, thick, sprinkled above and densely covered underneath with ciliate scales. Sori nearly buried under the scales, very numerous, mostly short, transverse but crowded in an apparently continuous line round the margin, usually about $1\frac{1}{2}$ line broad. A few short barren outer fronds often with only 3 pinnæ or a single cordate one.—*Bail. Litho. Ferns. Ql.* 172; *Gymnogramme Muellieri*, *Hook. Spec. Filic.* v. 148, t. 295, *Syn. Filic.* 879.

Hab.: Cleveland and Rockingham Bays, *W. Hill*, *Bowman*, *N. Taylor*; Gilbert River, *Armit*; Rockhampton, *Bowman*, *O'Shanesy*, *Thozet*.

3. ***G. rutæfolia*** (Rue-leaved), *R. Br. Prod.* 146; *Benth. Fl. Austr.* vii. 775. Fronds tufted, 3 to 6 in. long, pinnate. Pinnæ obliquely obovate or almost fan-shaped, 3 to 6 lines long and broad, toothed, lobed, or again somewhat pinnate, contracted into a short petiole, sprinkled above and more densely covered underneath as well as the rhachis with brown scaly hairs occasionally glandular. Veins forked and radiating. Sori linear, mostly about the middle of the pinna, sometimes almost covering the surface.—*F. v. M. Fragm.* v. 187; *Bail. Litho. Ferns Ql.* 173; *Gymnogramme rutæfolia*, *Hook. Spec. Filic.* v. 187, *lc. Pl.* t. 985, *Filic. Exot.* t. 5; *Hook. and Grev. Ic. Filic.* t. 90; *Kunze in Pl. Preiss.* ii. 110; *Hook. f. Fl. Tasm.* ii. 151; *Gymnogramme Pozoi*, *Kunze*; *Hook. and Bak. Syn. Filic.* 879; *Gymnogramme subglandulosa*, *Hook. and Grev. Ic. Filic.* t. 91; *Gymnogramme papaverifolia*, *Kunze*; *Bail. Ql. Ferns* 84.

Hab.: Port Denison, *Fitzalan*; Dalrymple Creek, *Hartman*; Springsure, *Wuth*; Maranoa River, *Mitchell*.

Also in South Western Europe, Chili and New Zealand.

4. ***G. pinnata*** (pinnate), *F. v. M. Fragm.* vi. 124; *Benth. Fl. Austr.* vii. 776. Rhizome shortly creeping. Fronds 1 to 2 ft. high, simply pinnate, glabrous. Pinnæ 3 to 11 or reduced to the single terminal one, lanceolate, 4 to 10 in. long, $\frac{1}{2}$ to 1 in. broad, contracted at the base into a short petiole, entire, the prominent midrib and rhachis smooth and shining. Veins diverging from the midrib forked and anastomosing. Sori linear or narrow-oblong, very unequal and irregularly

scattered.—Bail. Litho. Ferns Ql. 174; *Gymnogramme pinnata*, Hook. Spec. Filic. v. 151, Syn. Filic. 390; *Hemionitis elongata*, Brackenr. Filic. U.S. Expl. Exped. t. 8; *Dictyogramme pinnata*, T. Moore; Bail. Queensl. Ferns, 88.

Hab.: Common in the northern scrubs.

Also in the Malayan Archipelago and South Pacific Islands.

5. **G. ampla** (ample), *F. v. M. Fragm.* v. 188; *Benth. Fl. Austr.* vii. 777. Rhizome rather thick, scaly, creeping. Fronds 1 to 2ft. high, deeply pinnatifid, glabrous. Segments 8 to 11, lanceolate, 3 to 6in. long, $\frac{3}{4}$ to $1\frac{1}{2}$ in. broad when fertile, often 2in. when barren, acuminate, membranous, entire, decurrent and connected by a broad wing to the rhachis, the wing gradually tapering below the lowest pair but continued almost to the base of the stipes. Veins proceeding from the midrib immediately forked, one branch bearing a straight linear sorus extending usually to the margin, the other prominent flexuose with anastomosing branches, and from both are emitted a few short free branches.—Bail. Litho. Ferns Ql. 176.

Hab.: In all the dense tropical scrubs.

6. **G. membranacea** (membranous), *Blume, Fil. Jav.* 123, t. 52, f. 2. Rhizome slender, creeping, climbing up the stems of trees by the aid of adventitious roots emitted from the under side, the upper surface densely paleaceous, with rather long, dark-brown, narrow scales. Fronds membranous, somewhat distantly placed on the rhizome, simple or variously lobed, and either form soriferous, glabrous, 6 to 12in. long, tapering to a rather long stipes and elongated apex, the undivided fronds attaining a width of 2in. in the widest part, lobes on the divided ones from 1 to 12, spreading, tapering towards the point, but cut down so as to leave but a wing on the costa in the sinus about $\frac{1}{4}$ or $\frac{1}{2}$ in. wide, the segments varying from 1 to 4in. long; venation rather open forming large hexagonal areoles containing forked free veinlets; sori in short lines or oblong masses, often not exceeding 2 or 3 lines on the divided fronds, and distant from the costule, but on the entire simple fronds often reaching from near the costa to near the margin, but these lines are frequently interrupted.—Bail. Litho. Ferns Ql. 175.

Hab.: Bellenden-Ker, at an elevation of 4,000ft.

The habit of this fern and its variously formed fronds reminds one of *Polypodium scandens*, Forst., and further, when dry, it possesses the same fragrance as that and some allied *Polypodiums*. To pteridologists, the meeting of this species, bearing its various forms of foliage, is most interesting, and it saves the mistakes being made of multiplying species, and completes the description of an old species. *G. Sayeri*, *F. v. M.* and Baker, has been named from fronds of this species; and in all probability *G. Wrightii*, Hook., is but another form. I might here remark that probably Mr. Baker was not far wrong when he placed the Queensland fern, *G. ampla*, *F. v. M.*, under *G. elliptica*, for it varies greatly in the form of the fronds. In cultivation the fronds are much smaller and often entire, and these as frequently bear sori as the more developed deeply lobed ones. On starved plants, indeed, of *G. ampla*, the almost only distinctive mark to separate it from *G. membranacea* is its broad flattish rhizome and a slight difference, perhaps, in the venation.

88. MENISCIUM, Schreb.

(Referring to the sorus being in the form of a crescent or *meniskos*.)

Sori oblong or linear or sometimes orbicular and geminate, arising from the transverse connivent veinlets. No indusium. Veins or costules pinnated from the costa; veinlets numerous, the opposite ones uniting in an arc or angle, and sending out from that angle a free or continuous veinlet. Fronds simple or pinnatifid.—Hooker's Species Filicum, v., 162.

1. **M. triphyllum** (leaves of 3-leaflets), *Sw.*; *Hooker's Spec. Filic.* v. 163. Rhizome long, creeping, subulate-paleaceous; stipites pale-brown, glabrous, 4 to 5 inches long of the sterile, 1 foot or more long of the fertile ones; fronds

coriaceo-membranaceous, 3 to 5-foliolate, subdimorphous; pinnæ 3 to 5 in. long, $\frac{1}{2}$ to 1 in. broad, smaller and narrower in the fertile fronds; terminal pinnæ always the largest and long-petiolate, all of them oblong, acuminate, obtuse, or cuneate or subhastate at the base, the margin repando-dentate or nearly entire; venation subpubescent beneath; soriferous veins, 4, 7, or 8-arched, the sori extending the whole length of the transverse veinlet between the costules.

Hab.: Daintree River, in Baron Mueller's notice in the "Victorian Naturalist," October, 1885, of a few plants collected by Dr. T. P. Lucas in North Queensland. I have never seen any Queensland specimens of this plant.

84. ANTROPHYUM, Kaulf.

(From *antrum*, a den or hollow; the receptacles of sporangia being in a groove or channel.)

Rhizome creeping. Fronds simple, entire, lanceolate or broad, with longitudinal more or less anastomosing veins, bearing long linear sori without any indusium.

A small genus dispersed over the tropical regions of the New and the Old World.

1. ***A. reticulatum*** (reticulate), *Kaulf.; Hook. Spec. Filic.* v. 169; *Syn. Filic.* 898; *Benth. Fl. Austr.* vii. 777. Rhizome hairy, creeping. Fronds 6 in. to 1 ft. long, 1 to 1½ in. or rarely nearly 2 in. broad, acuminate, tapering into a short stipes, glabrous, rather firm, the veins prominent on the upper surface forming long narrow areoles. Sori all longitudinal, narrow-linear, but varying much in number and length.—Bedd. Ferns S. Ind. t. 52 and 281; Bail. Litho. Ferns Ql. 177; *A. plantagineum*, Kaulf.; Bail. Ql. Ferns, 88.

Hab.: Common in tropical localities.

The species is Asiatic, extending to the Pacific Islands.

85. ACROSTICHUM, Linn.

(So named because the fructification is often at the top of the fronds.)

Rhizome creeping sometimes to a great length or short and erect. Fronds undivided or pinnate, variously veined. Sori confluent, covering the under surface of the fertile fronds or pinnæ, which are usually smaller or narrower than the barren ones. No indusium.

A large genus, chiefly tropical, spread over both the New and the Old World.

Fronds simple, lanceolate, with free veins, the fertile ones nearly similar . . . 1. *A. conforme*.
Fronds pinnate. Pinnæ entire, the barren with numerous wavy parallel free veins,
the fertile very narrow-linear.

Barren pinnæ broadly-lanceolate, rounded or cuneate at the base . . . 2. *A. scandens*.
Barren pinnæ narrow-lanceolate, tapering to a petiole . . . 3. *A. sorbifolium*.
var. *leptocarpum*.

Fronds pinnate. Veins reticulate.

Pinnæ membranous, shortly and broadly pinnatifid, the fertile usually on
different fronds . . . 4. *A. repandum*.

Very like *A. repandum*, but much smaller in all its parts . . . 5. *A. Taylori*.

Fronds 2 to 3 ft. high, tufted, wing of rhachis and lobes wavy-toothed . . . 6. *A. neglectum*.

Pinnæ coriaceous, entire, the upper ones fertile on the same fronds . . . 7. *A. aureum*.

Fronds simple, narrow, with reticulate veins, contracted into a linear fertile
apex . . . 8. *A. spicatum*.

Fronds bipinnate, the fertile segments narrow-linear on different fronds
from the barren . . . 9. *A. pteroides*.

1. ***A. conforme*** (fertile and sterile fronds similar), *Swartz; Hook. Spec. Filic.* v. 198, *Syn. Filic.* 401; *Benth. Fl. Austr.* vii. 778. Rhizome creeping, scaly. Fronds simple, lanceolate, coriaceous, from a few inches to above 1 ft. long, $\frac{1}{2}$ to 1 in. broad, acute or acuminate, tapering into a stipes sometimes narrowly winged almost to the base; veins parallel, simple or forked, not close,

and concealed in the texture of the frond. Fertile fronds usually smaller and more obtuse.—F. v. M. Fragm. v. 198; Bail. Litho. Ferns, Ql. 178; *Elaphoglossum conforme*, Schott; Bail. Ql. Ferns, 9.

Hab.: Rockingham Bay, *Dallachy*; Bellenden Ker.

Widely spread over the tropical and southern extratropical regions of the New and the Old World.

2. ***A. scandens*** (climbing), *J. Sm.*; *Hook. Spec. Filic.* v. 249, *Syn. Filic.* 412; *Benth. Fl. Austr.* vii. 778. Rhizome woody, scaleless, creeping in swamps or climbing on trees. Fronds 1 to 3ft. long, simply pinnate. Pinnæ of the barren fronds broadly lanceolate, acuminate, rounded or cuneate at the base and shortly petiolate, 8 to 8in. long, $\frac{3}{4}$ to 1 $\frac{1}{2}$ in. broad, entire or slightly dentate. Coriaceous, smooth and shining. Veins very numerous fine and closely parallel, Pinnæ of the fertile fronds long and very narrow-linear, sometimes almost terete, sometimes flat and 2 lines broad.—F. v. M. Fragm. vi. 124; Bail. Litho. Ferns Ql. 179; *Stenochlæna scandens*, *J. Sm.*; Bail. Ql. Ferns, 10.

Hab.: Cape York, *W. Hill*; Rockingham Bay, *W. Hill*, *Dallachy*.

Also in tropical Asia and the Pacific Islands.

3. ***A. sorbifolium*** (Sorbus-leaved), *Linn.*; *Hook. Spec. Filic.* v. 241, *Syn. Filic.* 412, var. *leptocarpum*, *Benth. Fl. Austr.* vii. 779. Rhizome woody, often climbing trees to the height of 30 or 40ft. Fronds pinnate, 1 to 2ft. long. Pinnæ of the barren fronds lanceolate, acuminate, equally or obliquely tapering into a short petiole, 3 to 8in. long, 4 to 8 lines broad, often denticulate, not very thick but smooth and shining. Veins numerous, parallel, $\frac{3}{4}$ to 1 line apart. Pinnæ of the barren fronds more numerous, almost filiform, $\frac{1}{2}$ in. or more broad.—Bail. Litho. Ferns Ql. 180; *A. Brightiæ*, F. v. M. Fragm. vii. 119; *Lomariopsis Brightiæ*, F. v. M. in Bail. Ql. Ferns, 10.

Hab.: Rockingham Bay and other tropical localities. Common also in the south.

Spread over the tropical regions of the New and the Old World. Exceedingly variable as to the breadth of the fertile pinnæ, etc., and divided by Fée into seventeen species of a genus *Lomariopsis*, amongst which his *L. leptocarpa* and some others are well represented amongst *Dallachy's* specimens collected at Rockingham Bay.—*Benth.*

4. ***A. repandum*** (repand), *Blume*; *Hook. Spec. Filic.* v. 260; *Syn. Filic.* 419; *Benth. Fl. Austr.* vii. 779. Rhizome creeping. Fronds 1 to 2ft. long, pinnate, the rhachis scaly. Pinnæ of the barren fronds membranous, lanceolate, the lower ones obliquely truncate at the base and attached by the midrib, 3 to 5in. long, often under 1in. broad, pinnatifid with broad lobes rarely reaching halfway to the midrib, the upper pinnæ smaller more entire and confluent into a broad wing to the rhachis. Veins copiously reticulate, with a central vein opposite each lobe, one of the veins often produced into a seta in the sinus. Pinnæ of the fertile fronds much smaller and narrower, but usually more or less pinnately lobed or broadly crenate.—F. v. M. Fragm. v. 198; Bail. Litho. Ferns Ql. 181, 182.

Hab.: Tropical scrubs. Common.

Extends over the Malayan Archipelago to South China and the Pacific Islands.

5. ***A. Taylori*** (after Dr. Norman Taylor), *Bail., in Rep. of Ql. Accli. Soc., April, 1884.* Fronds scaly, somewhat tufted from a short, creeping, knotted rhizome, stipites of fertile fronds from under 2in. to 5in. long, slender, those of the sterile fronds usually shorter; fronds pinnate in the lower, pinnatifid in the upper part, and usually terminating in a narrow, tail-like, proliferous apex; pinnæ obtuse-oblong, very irregularly lobed, 1 to 8in. long, 3 to 9 lines broad. Veins forming a row of long costular areoles, the rest free to the margin, where one often is produced into a seta in the sinus.—Bail. Litho. Ferns Ql. 183-4.

Hab.: On wet rocks, Johnstone River.

Very near *A. repandum*, Bl., but a much smaller plant with a closer habit. Referred to by *Bentham* in *Fl. Austr.* vii. 779.

6. ***A. neglectum*** (neglected), *Bail. Syn. Ql. Fl.* 722. Rhizome creeping, with dark-coloured scales. Fronds of 2 kinds fertile and sterile, 2 to 3ft. high, lanceolate in outline, pinnatifid, stipes of the fertile frond more than half its length and bordered by a narrow wavy wing, a similar wing borders the stipes and rhachis of the sterile frond, segments linear-lanceolate, coarsely toothed, 3 to 4 in. long, $\frac{1}{2}$ to $\frac{3}{4}$ in. broad. Veins and sori as in *A. repandum*.—Baker. in Hook. Ic. t. 1689; *Bail. Litho. Ferns Ql.* 185.

Hab.: Trinity Bay ranges, *Bailey*.

7. ***A. aureum*** (golden), *Linn.*; *Hook. Spec. Filic.* v. 266, *Syn. Filic.* 428; *Benth. Fl. Austr.* vii. 779. Rhizome short, thick, erect. Fronds 2 to 6ft. long, pinnate, glabrous, the rhachis firm and smooth. Pinnæ distant, the lower ones petiolate, the upper sometimes shortly decurrent, coriaceous, entire, oblong, from 8 to 6in. long, $\frac{3}{4}$ to 1 $\frac{1}{2}$ in. broad, the fertile ones few or many in the upper part of the same fronds as the barren ones. Veins oblique, very fine and numerous; copiously reticulate.—Bedd. *Ferns S. Ind.* t. 204; *Bail. Litho. Ferns Ql.* 186; *A. fraxinifolium*, *R. Br. Prod.* 145.

Hab.: Port Bowen, *R. Brown*, *Woolfs*; Cape York, *W. Hill*, *Daemel*; York Peninsula, *N. Taylor*; Endeavour River, *A. Cunningham*; Rockingham Bay, *Dallachy*; Daintree River, *Fitzalan*; Brisbane River, *A. Cunningham*, *F. v. Mueller*. Chiefly in swampy flats or salt water marshes.

Widely spread over the tropical and subtropical regions of the New and the Old World.

8. ***A. spicatum*** (spike-like), *Linn.*; *Hook. Spec. Filic.* v. 280, *Syn. Filic.* 424; *Benth. Fl. Austr.* vii. 780. Rhizome thick, creeping. Fronds simple, 6 to 18in. long, the lower barren part lanceolate or linear-lanceolate, 3 to 9 lines broad, contracted at the top into a fertile linear apex 1 to 1 $\frac{1}{2}$ lines broad, of variable length. Veins in the barren part obliquely reticulate with a free veinlet within the areoles. Sori in the fertile part forming a broad continuous line on each side of the midrib with the free margin recurved over them when young but at length covering the under surface. Spore-cases often intermixed with peltate scales.—*Bail. Litho. Ferns Ql.* 187; *Hymenolepis spicata*, *Presl*; *Hook. Filic. Exot.* t. 78, *Gard. Ferns* t. 3; *Bedd. Ferns S. Ind.* t. 46.

Hab.: Brisbane River, Moreton Bay, *W. Hill*; Herbert River, *Bailey*.

Spread over tropical Asia, extending to the Mascarene and to the Pacific Islands.

9. ***A. pteroides*** (Pteris-like), *R. Br. Prod.* 145; *Benth. Fl. Austr.* vii. 780. Rhizome shortly creeping. Fertile fronds ovate-lanceolate in circumscription, 3 to 6in. long on a stipes at least as long, bipinnate. Segments linear, $\frac{3}{4}$ to 1 $\frac{1}{2}$ in. long, scarcely 1 line broad. Sori on very numerous diverging veins, at a little distance from the midrib, so close together as to cover the whole frond except the midrib and a very narrow margin recurved over the young sori. Barren fronds smaller than the fertile ones with linear-lanceolate segments, otherwise similar.—*Hook. Spec. Filic.* v. 279; *F. v. M. Fragm.* v. 139; *Bail. Litho. Ferns Ql.* 188; *Neurosoria pteroides*, *Metten.*; *Kuhn in Bot. Zeit.* 1869, 498.

Hab.: Gilbert River, *Armit*; Endeavour River, *G. Brown*.

36. PLATYCERIUM, Desv.

(From *platys*, broad, *keras*, horn; the fronds divided like staghorns.)

Rhizome short and thick. Fronds large, the outer ones of each year's growth barren and horizontally spreading, the fertile ones erect cuneate forked or dichotomous, the veins prominent radiating and reticulate. Sori forming very large broad patches towards the ends of the fronds.

A small genus, sparingly distributed over the Malayan Archipelago and tropical Africa and America.

Sori covering the ultimate lobes of the fertile ones 1. *P. alaicorne*.
Sori forming a large patch under the broad sinus of the primary division of the fertile fronds 2. *P. grande*.

1. **P. alciorne** (Elk's horn), *Desv.*; *Hook. Spec. Filic.* v. 282, *Syn. Filic.* 425; *Benth. Fl. Austr.* 780. Elk's-horn Fern. Barren fronds orbicular-cordate, cottony when young, 6in. to 1ft. long and broad, rigid, the margin more or less sinuate or obtusely lobed. Fertile fronds attaining 2 to 3ft., contracted into a distinct stipes, dilated upwards; once twice or thrice forked. Sori or patches of spore-cases occupying the whole or the greater part of the ultimate lobes.—*Bail. Litho. Ferns Ql.* 189; *Acrestichum alciorne*, *Swartz*; *R. Br. Prod.* 145; *Bot. Reg. t.* 262.

Hab.: Common in scrubs north and south.

Var. Hillii—*P. Hillii*, *T. Moore, Gard. Chron.* This only differs from the type in that the fronds are of a thicker texture and the lobes broader and shorter.—*Bail. Litho. Ferns Ql.* 190.

Hab.: *Cairns, W. Hill.*

Also in the Mascarene Islands.

2. **P. grande** (great), *J. Sm.*; *Hook. Spec. Filic.* v. 284, *Filic. Exot. t.* 86, *Syn. Filic.* 425; *Benth. Fl. Austr.* vii. 781. Stag's-horn Fern. A larger plant than *P. alciorne*, often more membranous but the primary veins more prominent. Barren spreading fronds often more than 2ft. diameter, the margin deeply and irregularly lobed. Fertile fronds from a broad rigid winged stipes expanding to a great breadth, dichotomously divided, but the first fork leaving a very broad truncate sinus under which the fructification forms a patch from 6 to 19in. broad, the forks on each side often above 3ft. long, deeply and dichotomously lobed but barren.—*Bedd. Ferns Brit. Ind. t.* 326; *Bail. Litho. Ferns Ql.* 191.

Hab.: Common in dense scrubs north and south.

Also in the Malayan Archipelago.

ADDITIONS AND CORRECTIONS.

p. 11—Line 4 from top, after *arillus*, add *Ill. Bot. Cook's Voy. Pl. 1.*

p. 12—Line 18 from bottom, after 414, add *Ill. Bot. Cook's Voy. Pl. 2.*

p. 12—Add: 2A. **H. dealbata** (whitened), *Benth. Fl. Austr. i. 21.* Young branches minutely rusty-downy. Leaves oblong or oblong-lanceolate, obtuse with a small callous point, or rarely acute, 2 to 3 in. long and $\frac{1}{2}$ to $\frac{3}{4}$ in. broad, narrowed at the base, but sessile or very shortly stalked, the margins flat, almost glabrous above, white underneath, with a very close tomentum, the costa and anastomosing veins rust-coloured. Spikes terminating the branches 1-sided, about 2 in. long, rusty-tomentose or silky. Flowers closely sessile within lanceolate bracts. Stamens as in *H. Banksii*.—*Hemistemma dealbata*, R. Br. in DC. Syst. Veg. i. 413; Deless. Ic. Sel. i. t. 76.

Hab.: On the coast sands at Somerset.

p. 16—Line 21 from top, after Thunb., add *Ill. Bot. Cook's Voy. Pl. 8.*

p. 19—Bottom line, after light, add *Bailey's Cat. Ql. Woods, No. 1A.*

p. 22—Line 21 from bottom, after hard, add *Bailey's Cat. Ql. Woods, No. 2.*

p. 22—Add:

3A. **UNONA**, Linn.

(Derivation obscure.)

Sepals 3, valvate. Petals 6, valvate or open in æstivation, 2-seriate; 3 inner sometimes absent. Torus flat or slightly concave. Stamens cuneate; anther-cells linear, extrorse, top of connective grooved; ovules 2 to 8, 1-seriate (rarely sub-2-seriate). Ripe carpels many, usually elongated and constricted between the seeds. Seeds few or many. Trees or shrubs, erect or climbing. Flowers solitary, axillary terminal or leaf-opposed.

The species are mostly belonging to tropical Asia and Africa.

1. **U. Wardiana** (after the widow of the late Rev. J. G. Ward), *Bail. "Niadoa," Mapoon, Roth.* A tall slender, straggling shrub. Branches terete, thickly covered with raised lenticels. Leaves varying much in size, the larger ones 2½ in. long and ¾ in. broad, underside pale, upper glossy-green, petioles slender and scarcely exceeding 1 line. Flowers solitary, terminal or in the upper axils. Peduncles 1 in. long, slender. Sepals elongate-cordate, 3 lines long. Petals (none on the specimens examined). Carpels stalked, few or many, constricted between the seeds, 1 to 4-jointed, glabrous, nearly globose; endocarp smooth but slightly transversely wrinkled.

Hab.: Mapoon, *J. F. Bailey.*

p. 28—Line 2 from bottom, after June, add *Ill. Bot. Cook's Voy. Pl. 4.*

Opposite p. 29, on Plate No. 1 and 2 for *Moorii* read *Moorei*.

p. 30—For **H. Selwynii** read **L. Selwynii**.

p. 81—Add: 2. **L. esiangkara** (aboriginal name), *Bail.* "Esiangkara," Mapoon, *Roth.* A slender, glabrous climber; stems sulcate. Leaves narrow, linear-lanceolate, 4 to 5 in. long, 3 to 5 lines broad, 8-nerved for three parts of their length the lateral nerves then looping, prominent as well as the reticulate veins, margins entire; petioles slender scarcely $\frac{1}{2}$ in. long. Peduncles slender, axillary, about 7 lines. Flowers probably few and minute (none perfect on specimens examined). Bracts linear minute; pedicels about 3 lines long. Carpels 3, red, oval, about 3 lines long, slightly compressed; endocarp slightly uneven.

Hab.: Mapoon, *J. F. Bailey.*

Roots eaten after being roasted.—*Roth.*

p. 81—Line 19 from bottom, add *Ill. Bot. Cook's Voy. Pl. 5.*

p. 41—Bottom line, for *ochrolenca* read *ochroleuca*.

p. 46—Add:

4A. CONRINGIA, Reichb.

Sepals elongate, equal at the base or the lateral saccate. Petals elongate, clawed. Pods elongate, linear, compressed or acutely tetragonal; valves 1 to 3-nerved, smooth or torulose; stigma simple or 2-lobed. Seeds 1-seriate, oblong, not margined; cotyledons incumbent. Glabrous glaucous annuals. Leaves entire, oblong, auricled. Flowers racemose, ebracteate, yellow.

Native of Western Asia and Southern Europe.

1. **C. orientalis** (Eastern), *Dum. Fl. Belg.* Hare's-ear Treacle-Mustard. An erect glabrous glaucous annual about 1 ft. high. Radical leaves obovate, petiolate, the stem ones oblong, 2 to 3 in. long, quite entire, and embracing the stem, with prominent rounded auricles. Flowers pale yellow, or whitish. Pods 3 to 4 in. long, slender, in a loose raceme, the midrib of the valves very prominent.

Hab.: Waste places in Southern Europe and Western Asia.

This has become a weed in some Brisbane gardens.—*C. perfoliata*, Link.; *Erysimum orientale*, R. Br.

p. 60—Line 9 from top, after 163, add *Ill. Bot. Cook's Voy. Pl. 6.*

p. 63—Line 17 from top, after 335, add *Ill. Bot. Cook's Voy. Pl. 7.*

p. 64—Line 10 from top, after 307, add *Calceolaria enneasperma*, O. Kuntze; *Ill. Bot. Cook's Voy. Pl. 8.*

p. 64—Line 2 from bottom, after 12, add *Calceolaria filiformis*, O. Kuntze; *Ill. Bot. Cook's Voy. Pl. 9.*

p. 65—Line 11 from bottom, after 106, add "Pu-kuru," "Ke-wan," Atherton, "Po-ata," Middle Palmer River, "Ung-gal," Nassau River, *Roth.*

p. 65—Line 8 from bottom, for wood read wool, and add *Maximiliana Gillivraei*, O. Kuntze; *Ill. Bot. Cook's Voy. Pl. 10.*

p. 70—Line 24 from bottom, after 78, add *Ill. Bot. Cook's Voy. Pl. 11.*

p. 77—Line 19 from bottom, after 22, add *Ill. Bot. Cook's Voy. Pl. 12.*

p. 78—Line 11 from bottom, after 325, add *P. longifolia*, Poir.; *Ill. Bot. Cook's Voy. Pl. 13.*

p. 79—Line 11 from top, after 3-lobed, add *Ill. Bot. Cook's Voy. Pl. 14.*

p. 79—Add: 6. **P. stenoclada** (slender-stemmed), *Benth. var. stenosepala* (sepals slender), *J. Britten Ill. Bot. Cook's Voy. 9, Fl. 15*. A small branching shrub; leaves oblong-linear, flat, $\frac{1}{2}$ to 1 in. long. Flowers in loose pedunculate racemes, much longer than the leaves. Inner sepals narrow pointed and falcate. Corolla of 3 petals, vexillum wanting. Wings oblong, obtuse, attenuated at the base. Keel crested. Stamens 8. Anthers subclavate, yellow. Ovary oblong-ovate, obtuse, emarginate, compressed. Style filiform, glabrous, stigma thickened. Capsule oval, seed solitary, hairy.—From Britt. l. c. and *Benth. Fl. Austr. i. 141*.

Hab.: Endeavour River. (*Britt., l. c.*)

p. 81—Line 11 from top, after ripe, add *Ill. Bot. Cook's Voy. Pl. 16*.

p. 82—Line 8 from top, after 297, add *Ill. Bot. Cook's Voy. Pl. 17*.

p. 82—Bottom line, for *carpophyllum* read *carpophilum*.

p. 97—Add: 3A. **C. quadrivalvis** (4-valved), *F. v. M. Fragm. i. 176*; *Benth. Fl. Austr. i. 173*. A glabrous annual, with small, oblong-spathulate, radical leaves, soon disappearing, and several decumbent or ascending stems, from a few in. to 1 ft. or rather more, and sometimes much branched. Stem-leaves from linear-spathulate to oblong or lanceolate, narrowed into a petiole, the lower ones often above 1 in. long, the upper ones few and small. Flowers small, pink, in loose racemes sometimes branching into panicles; pedicels $\frac{1}{2}$ to $\frac{3}{4}$ in. Bracts very small, herbaceous or slightly scarious. Sepals herbaceous, acute, about $1\frac{1}{2}$ line long. Petals 6, fully twice as long as the calyx. Stamens numerous, with small anthers. Style divided to the base into 4 linear stigmatic branches. Capsule about as long as the calyx, 4-valved, with numerous small seeds minutely pitted.—*Cosmia quadrivalvis*, *Britt. Journ. Bot. 1900, p. 77*; *Ill. Bot. Cook's Voy. Pl. 18*.

Hab.: Endeavour River.

p. 118—7. **A. butilon indicum**, *G. D.* The Australian plant is given by Mr. Britten in *Ill. Bot. Cook's Voy. Pl. 19*, as var. *australiense*.

p. 125—Line 15 from top, after 210, add "Yi-awara," Batavia River, *Roth*.

p. 126—Line 22 from top, after 117, add *Ill. Bot. Cook's Voy. Pl. 20*.

p. 127—After line 27 from top, add Roots eaten after being roasted, *Roth*.

p. 129—Line 10 from bottom, after glabrous, add *Ill. Bot. Cook's Voy. Pl. 21*, and line 9 from bottom, after Island, add Cape Grafton and Endeavour River, *Britten l. c.*

p. 130—Line 14 from bottom, after *Watkins*, add "Kornbrana," Batavia River, "Mamandur," Cooktown, "Mancha," Lower Tully River, *Roth*.

p. 130—Last line, add Inner bark used for making rope and twine.

p. 138—Line 14 from top, after 1, add *Bot. Mag. t. 6608*.

p. 148—Line 16 from bottom, after it, add *Ill. Bot. Cook's Voy. Pl. 22*.

p. 156—Add: 1A. **T. appendiculata** (bearing appendages), *F. v. M. Fragm. iii. 7*; *Benth. Fl. Austr. i. 273*. Shrubby, the whole plant densely tomentose-villous, or woolly. Leaves petiolate, broadly ovate-cordate, obtuse, 2 to 4 in. long, crenate, and sometimes sinuate-lobed, very soft and thick. Peduncles mostly 3-flowered. Sepals above $\frac{1}{2}$ in. long, woolly-tomentose, the dorsal appendages leafy and toothed, spreading, and forming on the bud a kind of

cup. Ovary hirsute, 8-celled. Capsule globular, hard, indehiscent, very villous, about as large as in *T. procumbens*, but the prickles less rigid, and sometimes wearing off; endocarp hard, divided into 6 1-seeded cells.

Hab.: Sweers Island, Gulf of Carpentaria, *J. F. Bailey*.

Mr. W. Botting Hemsley, of Kew (England), and Mr. James Britten, of the British Museum, have both pointed out that in the notice of *Triumfetta procumbens* in the Flora Australiensis, another species, *T. subpalmata*, has been confused; by the first-named botanist in Journal of Botany, xxviii. 1, with a plate 298, upon which is figured the two species, and the following brief note as to the most prominent distinguishing characteristics, &c.

1. ***T. procumbens***, *Forster, Prod. Fl. Ins. Austral. p. 35; Hook. et Arn. Bot. Beech, Voy. p. 60 (non Benth. Fl. Austr. i. p. 278); Syn. T. crassifolia, Sol.* Leaves on long petioles, softly tomentose, roundly-ovate or cordate, entire or 3-lobed, crenate. Fruit bearing numerous long feeble plumose prickles.

1a. ***T. subpalmata***, *Sol. Herb. Mus. Brit. and in Ic. Park. in Bibb. Mus. Brit. ined., Syn. T. procumbens, Benth. Fl. Austr. i. 278.* Leaves on short petioles rigid, scabrous, deeply 3 to 5-lobed, sharply toothed. Fruit shortly and rigidly prickled, prickles glabrous.

Mr. James Britten gives a full description of this latter species with Plate in Ill. Botany of Cook's Voy. Pt. i. Pl. 28.

p. 164—Line 10 from top, for Moorqun read Moorgun.

p. 171—Line 10 from bottom, for Catrops read Caltrop.

p. 178—Line 8 from top, after 290, add "Longarate," Batavia River, *Roth*.

p. 178—Line 22 from bottom, after 99, add Ill. Bot. Cook's Voy. Pl. 24.

p. 178—Line 24 from bottom, add Endeavour River, *Britten., Ill. Bot. Cook's Voy.*

p. 175—Line 18 from top, after 101, add Benth. Fl. Austr. i. 292.

p. 175—Line 27 from top, after 228, add Benth. Fl. Austr. i. 293.

p. 175—Line 40 from top, after 105, add Benth. Fl. Austr. i. 293.

p. 175—Line 47 from top, after 375, add Benth. Fl. Austr. i. 293.

p. 184—Line 6 from top, after 101, add Ill. Bot. Cook's Voy. Pl. 25.

p. 186—Line 9 from bottom, after petals, add pink.

p. 186—Line 7 from bottom, after upwards, add Ill. Bot. Cook's Voy. 26. In this work Mr. Britten states that "Brown did not collect the plants, as stated by Bentham." I think, however, if he did not collect it that it might have been sent to him, for I have just received specimens of it from Rev. Wilh. Poland, Bloomfield River. "Bala-bal-balgai" is given by Britten as the aboriginal name at Endeavour River.

p. 187—Line 2 from bottom, after 71, add Ill. Bot. Cook's Voy. Pl. 27.

p. 188—Line 5 from bottom, after 66, add Ill. Bot. Cook's Voy. Pl. 28.

p. 190—Line 3 from bottom, after beaked, add Ill. Bot. Cook's Voy. Pl. 29.

p. 194—Line 8 from top, for Billardiè read Billardieri.

p. 194—Line 7 from bottom, after xiii., add Ill. Bot. Cook's Voy. Pl. 31. The habitat given applies to the variety.

p. 196—Line 15 from top, after 186, add Ill. Bot. Cook's Voy. Pl. 3 and 84, under the name *Correa reflexa*, Vent.

p. 203—Line 25, for style read styles.

p. 209—Line 25 from top, after 27, add *Jambolifera laevis*, O. Kuntze, in Britt. Ill. Bot. Cook's Voy. Pl. 35.

p. 211—Line 15 from top, for introrse read intruse.

p. 212—Line 14 from top, after ripe, add Ill. Bot. Cook's Voy. Pl. 36.

p. 234—Line 18 from top, after 3-lobed, add Ill. Bot. Cook's Voy. Pl. 37.

p. 237—Line 25 from top, after 328, add Ill. Bot. Cook's Voy. Pl. 38.

p. 238—Line 18 from top, for Oxylea read Oxleya.

p. 257—Line 3 from bottom, after 401, add "Tchannan," Pennefather River, Roth.

p. 263—Line 10 from bottom, after 18, add Ill. Bot. Cook's Voy. Pl. 40.

p. 264—Line 11 from bottom, after 24, add Ill. Bot. Cook's Voy. Pl. 39.

p. 276—Line 18 from top, after 292, add Ill. Bot. Cook's Voy. Pl. 41.

p. 281—Line 24 from top, after 499, add "Lorwora," Middle Palmer River, "Takking," Nassau River, "Tampara," Princess Charlotte Bay, "Pulkun," Cooktown, "Lenn," Princess Charlotte Bay, Roth.

p. 282—Line 26 from top, after 449, add "Kang-ga," Cooktown, "Gang-gurur," Cape Bedford, "Mon-dol," Butcher's Hill, "Gang-a," Bloomfield River, "Achealla," Middle Palmer River, "Rabbab," Cooktown, "Anjigal," "Nai-ya," Princess Charlotte Bay. and "Mbau-nu," Batavia River, Roth.

p. 283—Line 22 from bottom, after Thozet, add "Ampo-ana," Red Island, "Pinnaka," Cooktown, Roth.

p. 284—Line 20 from bottom, after 78, add Ill. Bot. Cook's Voy. Pl. 41A.

p. 290—Line 17 from top, for Wadsworth read Wadsworthii.

p. 301—Line 22 from top, for ausrralis read australis.

p. 314—Line 8 from bottom, after 85, add Ill. Bot. Cook's Voy. Pl. 42 and 43.

p. 319—Line 24 from top, after 80, add Ill. Bot. Cook's Voy. Pl. 44.

p. 322—Line 4 from bottom, after terminal, add Ill. Bot. Cook's Voy. Pl. 45.

p. 325—Line 5 from top, after F. v. M., add Ill. Bot. Cook's Voy. Pl. 46.

p. 333—Line 5 from bottom, for ~~Amperstieae~~ read ~~Amherstieae~~.

p. 342—Line 24 from bottom, after 106, add Ill. Bot. Cook's Voy. Pl. 48.

p. 342—Line 21 from top, after 48, add "Gelanger," Endeavour River, Britten, Ill. Bot. Cook's Voy. Pl. 18.

p. 345—Line 15 from bottom, after long, add Ill. Bot. Cook's Voy. Pl. 49. Britten says the flowers are of a pretty red, not yellow. On specimens which I gathered on Thursday Island the flowers were of a pale lilac; other specimens gathered by H. A. Haswell on Lizard Island might, when fresh, have been white, yellow or pink.

p. 352—Line 5 from top, after 108, add Ill. Bot. Cook's Voy. Pl. 50.

p. 366—Line 14 from top, after 128, add Ill. Bot. Cook's Voy. Pl. 51.

p. 372—Line 22 from bottom, after 156, add Ill. Bot. Cook's Voy. Pl. 52.

p. 373—Add: 5A. **C. nana** (dwarf), *Burm. Fl. Ind.* 156, t. 48, fig. 2. An annual, 1ft. or less high, with copious slender terete ascending or spreading branches clothed with short silky hairs. Leaves $\frac{1}{4}$ to 1in. long, moderately firm, thinly silky above, densely so beneath, base subcuneate, stipules none. Bracts and bracteoles minute, subulate; flowers solitary or quasi-umbellate. Calyx $1\frac{1}{2}$ to 2 lines long, densely clothed with long silky hairs; teeth of lower lip

narrow, acuminate, teeth of upper lip connate. Corolla not exerted. Pod ovoid, about 4 lines long, seeds numerous.—*C. umbellata*, Wight in Wall. Cat. 5383; *C. biflora*, Herb. Madr. in Wall. Cat. 5381, not of Linn.; *C. sobolifera*, Grah. in Wall. Cat. 5420c; Baker in Hook.'s Fl. Brit. Ind. ii. 71.

Hab.: Sweers Island, *J. F. Bailey*.

p. 374—Line 4 from top, after Lam., add Ill. Bot. Cook's Voy. Pl. 53.

p. 380—Line 20 from bottom, after 211, add Ill. Bot. Cook's Voy. Pl. 54.

p. 380—Add: 2. ***L. corniculatus*** (small horn-like), *Linn. Ser. in DC. Prod.* ii. 214; *Benth. Fl. Austr.* ii. 188. A perennial with prostrate, decumbent, ascending or almost erect stems, from a few in. to nearly 2ft. high, usually glabrous or somewhat glaucous, but often hairy in other countries. Leaflets usually obovate or ovate, acute, and rarely much above $\frac{1}{2}$ in. long, the 2 stipular ones broader and very oblique, but sometimes all narrow. Flowers yellow, often tinged with bright red, from about 5 to near 10 in the umbel. Calyx 3 to 3 $\frac{1}{2}$ lines long, usually slightly hairy, the lobes narrow and subulate-acuminate, about as long as the tube. Standard fully 5 lines diameter, wings nearly as long; keel with a long straight beak. Pod linear, terete, straight, rather slender, 1 to 1 $\frac{1}{2}$ in. long. Seeds globular, separated by thin transverse partitions.—Hook. f. Fl. Tasm. i. 98.

Hab.: Killarney, *Jos. Wedd.*

p. 382—Line 5 from bottom, after 192, add "Kalo," Boulia, *Roth.*

p. 385—Line 19 from bottom, after 494, add Ill. Bot. Cook's Voy. Pl. 55.

p. 386—Line 18 from bottom, after 104, add Ill. Bot. Cook's Voy. Pl. 56.

p. 387—Line 23 from bottom, after 104, add Ill. Bot. Cook's Voy. Pl. 57.

p. 388—Line 24 from bottom, after long, add Ill. Bot. Cook's Voy. Pl. 58.

p. 390—Line 21 from bottom, after Herb., add Ill. Bot. Cook's Voy. Pl. 59.

p. 392—Line 10 from bottom, after orbicular, add *Cracca reticulata*, O. Kuntze, Britt. in Ill. Bot. Cook's Voy. Pl. 60; aboriginal name "Gangol-malkai," Britt. l.c.

p. 394—Line 12 from bottom, after Solander, add *Cracca filipes*, var. *latifolia*, O. Kuntze; Britt. in Ill. Bot. Cook's Voy. Pl. 61.

p. 395—Line 26 from bottom, after *Henne*, add *Cracca purpurea*, var. *longifolia*, Linn.; Britt. Ill. Bot. Cook's Voy. Pl. 62.

p. 396—Line 14 from bottom, after thick, add Bot. Mag. t. 6541.

p. 399—Line 4 from top, after 86, add *Sesban aculeatus*, Poir.; Britt. Ill. Bot. Cook's Voy. Pl. 63.

p. 406—Line 14 from bottom, after 32, add *Diphaca cochinchinensis*, Lour., Britt. in Ill. Bot. Cook's Voy. Pl. 64; the aboriginal name given being "Gellanger."

p. 408—Line 19 from bottom, after 220, add *Damapana conferta*, O. Kuntze; Britt. Ill. Bot. Cook's Voy. Pl. 65.

p. 423—Line 9 from top, after 394, add Ill. Bot. Cook's Voy. Pl. 66.

p. 423—Line 13 from bottom, after 125, add Ill. Bot. Cook's Voy. Pl. 67.

p. 424—Line 27 from top, after 124, add *Caulinia bimaculata*, O. Kuntze; Britt. Ill. Bot. Cook's Voy. Pl. 68.

p. 424—Line 6 from bottom, after mss, add *Caulinia retusa*, O. Kuntze; Britt. Ill. Bot. Cook's Voy. Pl. 69.

p. 425—Line 8 from bottom, after 281, add *Caulinia rubicunda*, Moench.; Britt. Ill. Bot. Cook's Voy. Pl. 70.

p. 427—Line 19 from bottom, after seeds, add Ill. Bot. Cook's Voy. Pl. 71.

p. 429—Line 12 from bottom, after ?), add *Stizolobium giganteum*, Spreng.; Britt. Ill. Bot. Cook's Voy. Pl. 72.

p. 480—Line 22 from top, after smooth, add Ill. Bot. Cook's Voy. Pl. 73.

p. 481—Line 15 from bottom, after quoted, add *Canavali maritima*, P. Thouars; Britt. Ill. Bot. Cook's Voy. Pl. 74.

p. 488—Line 26 from top, after glabrous, add Ill. Bot. Cook's Voy. Pl. 75.

p. 484—Line 24 from top, after 258, add "To-e, Batavia River, Roth.

p. 484—Line 8 from bottom, after 259, add "Andau-ga," and "Ara-ra," Princess Charlotte Bay; "Balcha" and "Pa-po-in," Cooktown, Roth.

p. 484—Line 19 from bottom, after 42, add *Vigna capensis*, Walp.; Britt. in Ill. Bot. Cook's Voy. Pl. 76.

p. 485—Line 14 from bottom, after 388, add Ill. Bot. Cook's Voy. Pl. 77.

p. 485—Line 25 from bottom, after 260, add "Malaga," Cloncurry, Roth.

p. 489—Line 8 from top, after 400, add Ill. Bot. Cook's Voy. Pl. 78.

p. 440—Line 19 from bottom, after strophiole, add *Dolicholus Cunninghamii*, Britt. Ill. Bot. Cook's Voy. Pl. 79.

p. 448—Line 22 from bottom, after seed, add Ill. Bot. Cook's Voy. Pl. 80.

p. 465—Line 8 from bottom, after silky, add Pod oval, $1\frac{1}{2}$ in. long 8 lines broad, obliquely apiculate, light-brown, velvety. Seeds 2, compressed-globose, 2 lines diameter, glossy-brown, with longitudinal and transverse lines; funicle stout, brown at the base, the upper portion enlarged into a globose green gibbosity.

Hab.: Cape Bedford, Rev. W. Poland, June, 1902.
Roots eaten roasted.

p. 469—Line 21 from bottom, after 78, add Ill. Bot. Cook's Voy. Pl. 81.

p. 470—Line 11 from top, after 159, add F. v. M. Ic. Dec. xiii. 9.

p. 471—Line 7 from bottom, after glossy, add F. v. M. Ic. xiii. 8.

p. 472—Line 18 from bottom, after seeds, add F. v. M. Ic. Dec. xiii. 10.

p. 482—Line 29 from top, after 184, add Ill. Bot. Cook's Voy. Pl. 82.

p. 484—Add: 11A. **A. spondylophylla** (leaf worm-like), F. v. M. *Fragm.* viii. 248, Ic. Dec. iii. 7. A spreading pilose, viscid shrub. Phyllodia verticillate, 9 to 13 in a whorl, 4 to 8 lines long, $\frac{1}{4}$ to $\frac{1}{2}$ line thick, straight, roughly-striate and cuspidate. Stipules lanceolate-subulate, about 1 line long. Peduncles about 1 in. long, axillary, solitary. Flowers in a globose head; petals cohering to above the middle, about 1 line long. Pods 1 to $1\frac{1}{2}$ in. long, 8 to 4 lines broad, narrow elongate-oblong, undulately crisped. Seeds transverse, ovate, the funicle thickened boat-like under the seed.

Hab.: Southern, inland near the N.S.W. border (F. v. M.)

p. 490—Line 18 from top, after 458, add Ill. Bot. Cook's Voy. Pl. 83.

p. 495—Line 12 from top, after it, add Ill. Bot. Cook's Voy. Pl. 84.

p. 499—Line 5 from bottom, after DC., add Ill. Bot. Cook's Voy. Pl. 85.

p. 501—Line 26 from bottom, after 9, add "Dun-dul," Cape Bedford, "Tunjol," Cooktown, Roth. After 12th line from bottom add Fibre used in making dilly-bags.

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- p. 504—Line 23 from top, after 9, add Ill. Bot. Cook's Voy. Pl. 86.
 p. 509—Line 8 from bottom, after longitudinal, add Ill. Bot. Cook's Voy. Pl. 87.
 p. 510—Line 7 from top, after 407, add "I-wa-wal," Middle Palmer River, Roth.
 p. 511—Line 12 from bottom, after ripe, add Ill. Bot. Cook's Voy. Pl. 88.
 p. 512—Line 6 from bottom, after 168, add Ill. Bot. Cook's Voy. Pl. 89.
 p. 514—Line 10 from bottom, after 337, add Ill. Bot. Cook's Voy. Pl. 90.
 p. 521—Line 3 from top, after 10, add Ill. Bot. Cook's Voy. Pl. 91.
 p. 524—Line 25 from bottom, after 2-seeded, add *Parinari uonda*, F. v. M.; Britt. Ill. Bot. Cook's Voy. Pl. 92.
 p. 543—Line 14 from bottom, after 1830, add Ill. Bot. Cook's Voy. Pl. 93.
 p. 543—Line 2 from bottom, after 24, add Ill. Bot. Cook's Voy. Pl. 94.
 p. 550—Line 6 from top, after xii, add Ill. Bot. Cook's Voy. Pl. 95.
 p. 552—Line 3 from top, after 305, add Ill. Bot. Cook's Voy. Pl. 96.
 p. 560—Line 14 from bottom, after 32, add Ill. Bot. Cook's Voy. Pl. 97.
 p. 561—Line 7 from bottom, after them, add Ill. Bot. Cook's Voy. Pl. 98.
 p. 562—Line 9 from bottom, after 90, add Ill. Bot. Cook's Voy. Pl. 99.

p. 566—Add: 5A. **T. pterocarpa** (winged fruit), F. v. M. *Fragm.* ii. 152. A shrub or small tree with spreading branches, glaucous, velvety-pubescent or hoary. Leaves $1\frac{1}{2}$ to $2\frac{1}{2}$ in. long, narrow-lanceolate, obtuse at the apex decurrent on the petiole; primary nerves distant. Petioles slender, the greater part often winged by the decurrent base of the lamina. Spikes axillary, about $1\frac{1}{2}$ in. long. Calyx-limb much shorter than the adnate tube. Disk hairy; styles and stamens glabrous. Fruit 2-winged, $\frac{3}{4}$ to $1\frac{1}{2}$ in. long and $\frac{1}{2}$ to $\frac{3}{4}$ in. broad including the wings, which are confluent above and below, completely surrounding the hard dry drupe.

Hab.: Sweers Island, J. F. Bailey. This island plant differs from those growing on the mountains in its more velvety indumentum.

- p. 568—Line 7 from top, after 159, add "Ngo-go-ro," Cape Bedford; "Ngorkuru," Cooktown; "Jinjajalga," Bloomfield, Roth.
 p. 569—Line 24 from top, after long, add Ill. Bot. Cook's Voy. Pl. 100.
 p. 575—Line 2 from bottom, after D, add Ill. Bot. Cook's Voy. Pl. 101.
 p. 581—Line 6 from bottom, after tube, add Ill. Bot. Cook's Voy. Pl. 102.
 p. 584—Line 25 from top, after 297, add Ill. Bot. Cook's Voy. Pl. 103.
 p. 584—Line 28 from top, after collectors, add Ill. Bot. Cook's Voy. Pl. 104.
 Hab.: Endeavour River, Point Lookout, Banks; Britt. l.c.
 p. 588—Line 11 from bottom, after 35, add Ill. Bot. Cook's Voy. Pl. 105.
 p. 590—Line 15 from top, after form), add Ill. Bot. Cook's Voy. Pl. 106.
 p. 591—Line 11 from top, after 298, add Ill. Bot. Cook's Voy. Pl. 107.
 p. 594—Line 3 from bottom, after 523, add Ill. Bot. Cook's Voy. Pl. 108.

p. 595—Add: 2A. **C. Polandii** (after Rev. W. Poland), *Bail.* A bushy swamp plant more or less densely silky-pubescent, stems sulcate. Leaves oblong-lanceolate, $1\frac{1}{2}$ to $4\frac{1}{2}$ in. long, $\frac{1}{4}$ to nearly $1\frac{1}{2}$ in. broad, coriaceous, margin and its close intramarginal nerve very prominent, apex apiculate, the parallel nerves rather close and as well as the reticulation prominent. Early inflorescence

clothed by lanceolate bracts, thus resembling an ear of wheat. Spike from 2 to 4 in. long. Calyx-tube about 2 lines, slightly hairy, lobes short and broad, woolly, ciliate at the top. Petals ovate, yellowish-green, long as calyx-tube, the margin near the top woolly. Stamens of irregular length, straight and crowded round the style, purple, the anthers of a still darker colour. Style compressed, purplish, slightly exceeding the stamens. Stigma with an almost white border. Fruiting calyx globose about 3 lines diameter.

Hab.: Bloomfield River, *Rev. W. Poland.*

p. 595—Add: 2b. **C. rigidus** (rigid), *R. Br. in Bot. Reg. t. 393; Benth. Fl. Austr. iii. 121; Britt. Ill. Bot. Cook's Voy. Pl. 109.* A tall shrub. Leaves linear-lanceolate, poroso-punctulate. Calyx monophyllous, tube ovate-cylindric, about 2 lines diameter, green, limb 5-partite, segments subrotundate deciduous. Petals 5 blood-red ovate-rotundate. Filaments filiform, $\frac{3}{4}$ in. long, of an intense blood-colour, connate in 5 bundles. Anthers ovate somewhat erect, orange-brown. Stigma obtuse.—From *Britt. l.c.*

Hab.: Endeavour River, *Banks.*

p. 598—Line 4 from bottom, after 352 ?, add *Ill. Bot. Cook's Voy. Pl. 110.*

p. 599—Line 13 from bottom, after 243, add *Ill. Bot. Cook's Voy. Pl. 111.*

p. 600—Line 15 from bottom, after 212, add *Ill. Bot. Cook's Voy. Pl. 113.* This plate represents a form of my var. *Cunninghamii.*

p. 600—Line 11 from bottom, after 352, add *Ill. Bot. Cook's Voy. Pl. 112.* This represents the normal form met with in tropical Queensland.

p. 602—Line 9 from bottom, after 335, add *Ill. Bot. Cook's Voy. Pl. 114.*

p. 603—Line 20 from bottom, after 194, add *Ill. Bot. Cook's Voy. Pl. 115.*

p. 627—Line 14 from bottom, after 92, add *Ill. Bot. Cook's Voy. Pl. 116.* Aboriginal name "Kaikur," *Britt. l.c.*

p. 633—Line 26 from top, after wing, add *Ill. Bot. Cook's Voy. Pl. 117.*

p. 636—Line 12 from top, after 81, add *Ill. Bot. Cook's Voy. Pl. 118.*

p. 637—Line 4 from bottom, after 275, add *Bot. Mag. t. 7529.*

p. 643—Line 15 from bottom, for *R.* read *B.*

p. 647—Line 11 from top, after broader, add *Ill. Bot. Cook's Voy. Pl. 119.*

p. 654—Line 4 from top, after 3, add *Ill. Bot. Cook's Voy. Pl. 120.*

p. 657—Line 29 from top, for *F.* read *P.*

p. 661—Line 8 from top, after 13, add *Ill. Bot. Cook's Voy. Pl. 121.*

p. 665—Add: 33. **E. subopposita**, *Bail.* "Tarbugai," Tully River, *Roth.* A weak almost climbing shrub, stems 15 to 20 ft. Branchlets often very slender with a loose fibrous bark. Leaves alternate, opposite or nearly so, lanceolate, base obtuse or slightly cordate, attaining 7 in. in length with a breadth of $2\frac{1}{4}$ in. just above the base; thin-coriaceous, lateral nerves numerous, parallel, joining in an intramarginal one rather straight and somewhat distant from the margin. Petioles thick, black, rugose, about 2 lines long. Flowers in short panicles or cymes at the ends of the branchlets or in the upper axils. Buds clavate by the tapering of the calyx-tube upon the pedicel. Pedicels very slender, about 2 lines long. Calyx-tube at time of flowering urceolate 3 lines long, longitudinally wrinkled, lobes 4 or 5, scarcely a line long, hoary outside. Petals rather more than twice the length of the calyx-lobes, very fugacious. Filaments capilliform, crimson, 7 to 9 lines long. Anthers minute,

light-coloured. Ovary at the bottom of the calyx. Ovules few, probably only 1 maturing as in all the flowers examined one ovule seemed to soon become enlarged, fleshy substance of cotyledons rich-purple. Fruit not seen.

Hab.: Tully River, J. F. Bailey, W. E. Roth.

p. 666—Line 11 from bottom, after broad, add *Huttum calyptratum*, Britt. in Journ. Bot. 1901, 67, and Ill. Bot. Cook's Voy. Pl. 123, where the following are given as synonyms:—*Barringtonia edulis?*, Seem. Fl. Vit. 82 (1865) ex Seem. l.c. 88; *B. calyptrata*, R. Br. ex Benth. Fl. Austr. iii. 288 (1866); *Butonica calyptrata*, Miers. in Trans. Linn. Soc. 2 ser. i. 76 (1875); *Michelia calyptrata*, O. Kuntze Rev. Gen. i. 240 (1891).

p. 667—Line 16 from bottom, after 289, add *Cumbia australis*, Britt. in Journ. Bot. 1901, 86, and Ill. Bot. Cook's Voy. Pl. 124, where the following are given as synonyms:—*Barringtonia Careyia*, F. v. M. Fragm. v. 183 (Dec. 1866); *C. arborescens*, Leich., F. v. M. l.c.; *Planchonia crenata*, Miers in Trans. Linn. Soc. Ser. 2, i. 91 (1875); *Eugenia crenata*, Sol. ex. Miers, l.c.; *Butonicoides crenata*, R. Br. ex Miers, l.c.; *Careya crenata*, R. Br. ex Miers, l.c.

p. 678—Line 12 from bottom, after 260, add Ill. Bot. Cook's Voy. Pl. 125.

p. 674—Line 23 from bottom, after 305, add *A. baccifera*, Linn.; Brit. Ill. Bot. Cook's Voy. Pl. 126.

p. 675—Line 8 from top, after transversely, add Ill. Bot. Cook's Voy. Pl. 127.

p. 677—Line 25 from top, after 1996, add Ill. Bot. Cook's Voy. Pl. 128.

p. 689—Line 18 from top, after 312, add Ill. Bot. Cook's Voy. Pl. 129.

p. 690—Line 22 from top, for *curica* read *carica*.

p. 708—Line 27 from top, after 1701, add *Halimum portulacastrum*, O. Kuntze; Britt. Ill. Bot. Cook's Voy. Pl. 130.

p. 710—Line 21 from top, for panicles read funicles.

p. 711—Line 1, for on read or.

p. 716—Line 4 from bottom, after 303, add Ill. Bot. Cook's Voy. Pl. 131.

p. 718—Line 21 from bottom, after 237, add Ill. Bot. Cook's Voy. Pl. 132.

p. 719—Line 27 from bottom, after l.c., add Ill. Bot. Cook's Voy. Pl. 133.

p. 720—Line 12 from bottom, after leaves, add Ill. Bot. Cook's Voy. Pl. 135.

p. 721—Line 19 from bottom, after 38, add Ill. Bot. Cook's Voy. Pl. 136.

p. 721—Line 5 from bottom, after 79, add Ill. Bot. Cook's Voy. Pl. 137.

p. 733—Line 7 from bottom, after 114, add Bot. Mag. t. 6798.

p. 748—Line 13 from bottom, after valves, add *Oldenlandia mitrasacmoides*, F. v. M.; Bot. Ill. Bot. Cook's Voy. Pl. 138.

p. 750—Line 3 from top, after 15, add Ill. Bot. Cook's Voy. Pl. 139.

p. 751—Line 14 from top, after Benth., add *Fl. Austr.* iii. 407.

p. 757—Add: 1a. **G. merikin** (its aboriginal name), *Bail.* A shrub of about 5 or 6ft. high. Branches dichotomous; bark papery, stigose on the young shoots. Leaves 3 to 7in. long, 2in. or more broad above the middle, sessile and clasping the stem by rounded auricles, obtuse or more or less acuminate, margins slightly sinuous, texture thin, the lateral nerves about 10 on each side of the midrib, which with the midrib are clothed with appressed grey bristle-like hairs. (No flowers to hand). Fruit terminal becoming lateral or leaf-opposed by the elongation of one branch, nearly or quite sessile, globular or

obpyriform, 1½ in. in diameter, 1-celled, more or less hairy. Seeds smooth angular, ½ in. long. I have only had ripe fruit to examine and from these the plant seems a true *Gardenia*, otherwise it somewhat resembles *Randia hirta*.

Hab.: Atherton, Dr. W. E. Roth.

p. 758—Line 22 from bottom, after 416, add Ill. Bot. Cook's Voy. Pl. 141.

p. 759—Line 4 from top, after 478, add Ill. Bot. Cook's Voy. Pl. 143.

p. 761—Line 23 from top, after 184, add *Nelitris timon*, Britt. in Journ. Bot. 1901, 68, and Ill. Bot. Cook's Voy. Pl. 142.

p. 761—Line 3 from bottom, after 128, add *Knoxia stricta*, Gærtn., Ill. Bot. Cook's Voy. Pl. 151.

p. 764—Line 11 from bottom, after lines, add Ill. Bot. Cook's Voy. Pl. 144.

p. 768—Line 12 from bottom, after long, add *Colospermum decipiens*, Baill. ; Britt. Ill. Bot. Cook's Voy. Pl. 145.

p. 770—Line 20 from bottom, after rugose, add *Myrstiphyllum nesophilum*, Britt. Ill. Bot. Cook's Voy. Pl. 146.

p. 771—Add: 6. **P. Fitzalani**. Fruiting specimens of what I believe to belong to this species have been sent to me by Dr. W. E. Roth. They were gathered by him on the Pennesfather River, the aboriginal name in that locality being, he states, "Je-an-jata." The fruit, which hitherto has not been described, is oval-oblong, slightly exceeding 2 lines long, deeply sulcate, and seems to have been red when fresh.

p. 771—7. **P. nematopoda**. This species should have been placed in TRIBE I.

p. 771—Line 5 from top, after furrowed, add *Myrstiphyllum loniceroides*, Britt. Ill. Bot. Cook's Voy. Pl. 147.

p. 771—Line 9 from bottom, after vii., add 48.

p. 774—Line 7 from bottom, after 4, add Ill. Bot. Cook's Voy. Pl. 148, where the following are given as synonyms :—*M. armata*, Hook. ; *M. echinata*, F. v. M. ; *M. Antoinii*, F. v. M. ; and *Epidendroides tetrandra*, Sol. MSS. Britt.

p. 776—Line 12 from top, after Benth., add Ill. Bot. Cook's Voy. Pl. 149.

p. 777—Line 5 from top, after 395, add Ill. Bot. Cook's Voy. Pl. 150.

p. 778—Line 3 from bottom, after base, add *Tardavel marginata*, Britt. Ill. Bot. Cook's Voy. Pl. 152.

p. 782—Add: 3. **G. aparine** (from the Greek, to lay hold of), Linn. ; DC. Prod. iv. 608 ; var. *minor*, Benth. Fl. Austr. iii. 447. A trailing or climbing annual often several feet long, clinging by recurved asperities or small prickles on the angles of the stems and on the edges and midribs of the leaves. Leaves 5 or 6 in the whorl, in the larger forms 6 to 8, linear or linear-lanceolate, often above 1 in. long. Peduncles axillary, bearing a loose cyme of 3 or more small greenish-white flowers, with 3 or 4 leaves at the base of the cyme. Fruit covered with hooked bristles forming very adhesive burrs.

Hab.: Wickham Terrace Reserve, Robt. McDowall. Only met with as a weed in a few southern gardens.

p. 803—Line 3 from top, after 470, add Ill. Bot. Cook's Voy. Pl. 155.

p. 808—Add: 12. **O. arguta** (sharp), Benth. Fl. Austr. iii. 487. A shrub or undershrub, of 1 to 2 ft., more or less hirsute with septate hairs and somewhat glutinous. Leaves oblong-lanceolate, acute, entire or with a few

pointed teeth towards the end, narrowed below the middle, but broad and stem-clasping at the base, 2 to 4 in. long. Flower-heads rather large, solitary, on peduncles longer than the leaves, with 1 or 2 small bracts. Involucre nearly hemispherical, the bracts narrow, acute, the inner one 4 to 5 lines long, the outer ones shorter. Ray-florets numerous; disk-florets not longer than the involucre. Achenes pubescent. Pappus—bristles nearly equal.—*Aster argutus*, R.Br. Herb.

Hab.: Islands of the Gulf of Carpentaria.

Nearly allied in essential characters to *O. rudis*.—Benth., l.c.

p. 811—Line 25 from bottom, after 171, add. Ill. Bot. Cook's Voy. Pl. 154.

p. 822.—Line 18 from top, after 140, add Ill. Bot. Cook's Voy. Pl. 158.

p. 824—Line 21 from bottom, after Wall, add Ill. Bot. Cook's Voy. Pl. 156.

p. 824—Line 6 from bottom, after 524, add Ill. Bot. Cook's Voy. Pl. 157.

p. 825—Line 11 from top, after 522, add Benth. Fl. Austr. iii. 657.

p. 836—Line 2 from bottom, after heads), add Ill. Bot. Cook's Voy Pl. 163.

p. 836—Line 5 from bottom, after 188, add Ill. Bot. Cook's Voy. Pl. 164.

p. 837—Line 14 from top, after Exs., add Ill. Bot. Cook's Voy. Pl. 165.

p. 838—Line 3 from top, after collinum, add Ill. Bot. Cook's Voy. Pl. 166.

p. 841—Add: 1A. **C. denticulata** (toothed), *R. Br. in Trans. Linn. Soc.* xii. 127; *Benth. Fl. Austr.* iii. 586. A shrub with glabrous or hoary tomentose branches. Leaves oblong or broadly lanceolate, acute, often narrowed below the middle but half stem-clasping at the base, often all under $\frac{1}{2}$ in. and rarely $\frac{1}{2}$ in. long, coriaceous, the margins recurved and minutely scabrous-denticulate or quite entire, glabrous and smooth above, hoary or rusty underneath with a minute scarcely perceptible tomentum, rarely loose and more copious. Flower-heads in a broad rather loose convex corymb much exceeding the leaves. Involucre broadly ovoid, 2 lines long or rather more, white or straw-coloured, the bracts very obtuse. Florets about 10 to 12, the receptacle-scales as long as the florets.—DC. Prod. vi. 155.

Hab.: Killarney, *Jos. Wedd.* The entire leaved form.

p. 845—Line 14 from bottom, after 594, add Ill. Bot. Cook's Voy. Pl. 162.

p. 861—Line 11 from bottom, after ripe, add *Niebuhr's spilanthis*, Britt. in Journ Bot. 1901, 69, and Ill. Bot. Cook's Voy. Pl. 159.

p. 862—Line 10 from top, after 548, add *Niebuhr's biflora*, Britt. in Journ. Bot. 1901, 69, and Ill. Bot. Cook's Voy. Pl. 160.

p. 868—Line 3 from top, after 63, add Ill. Bot. Cook's Voy. Pl. 161.

p. 878—Line 22 from bottom, after 69, add *Crossocephalum pseudochina*, O. Kuntze; Britt. Ill. Bot. Cook's Voy. Pl. 167.

p. 878—Add:

77A. *ARCTIUM, Linn.

(From *Arktos*, a bear; in allusion to the bristly flower-heads).

Involucre sub-globose; bracts in numerous series, appressed, tips subulate spreading glochidiate. Receptacles flat, densely bristly. Filaments glabrous; anther-bases sagittate; auricles small, tails setaceous. Style-branches linear, with a basal pencil of hairs, or style pubescent below the branches. Achenes oblong, sub-3-quetrous, many ribbed, glabrous, shining, truncate base sub-equal; pappus hairs short, copious, serrulate, deciduous separately.—Tall coarse erect

branching herbs. Leaves alternate or radical, broad, undivided. Heads terminal, sessile, solitary or fasciculate, homogamous; florets all similar, hermaphrodite, fertile, tubular, purplish, limb cylindric 5-fid.

Species few, belonging to temperate Asia and Europe.

1. **A. Lappa** (an old generic name), *Linn. Hook. Fl. Brit. Ind.* iii. 359. Common Burdock. A tall coarse herb 2 to 4ft. high. Leaves often 1ft. long, ovate-cordate, margins sinuate, usually cottony on the underside. Flower-heads $\frac{3}{4}$ to 1 $\frac{1}{2}$ in. diameter on stout peduncles. Involucral bracts slender, hooked. Corolla and stamens purple, styles white. Achenes angled and ribbed grey mottled with black.—*Lappa major*, Gaertn.

Hab.: Mackay.

77B. *CARDUUS, Linn.

(An old Latin name for thistle).

Involucre ovoid hemispheric or globose; bracts in many series, appressed, erect spreading or recurved and spinescent or with a spinescent appendage. Receptacle flat or convex, densely bristly. Filaments hairy or glabrous. Anther-bases sagittate, auricles connate, tails slender. Style-branches short, rarely filiform, obtuse. Achenes glabrous, obovoid, obtusely 4-angled, smooth or 5 to 20-ribbed, truncate or the top umbonate, basal areole nearly straight; pappus copious, hairs many-seriate, rigid, simple or barbellate, deciduous with a basal ring. Erect thistles. Leaves alternate, often decurrent, serrate-toothed or pinnatifid, spinescent. Flower-heads solitary and long peduncled or subsessile, scattered or crowded, homogamous; flowers all hermaphrodite and fertile (rarely dioecious), white yellow or red, tube slender, limb equal or oblique, 5-fid.

Distributed over temperate Europe, N. Africa and Asia.

1. **C. pycnocephalus** (dense headed), *Linn.* Slender flowered Thistle. A stiff annual or biennial, from 1 to 4ft. high, covered, especially the stems and the underside of the leaves, with a white loose cottony down. Leaves pinnatifid, with short wavy, very prickly lobes, and decurrent along the stem, forming waved prickly wings. Flower-heads rather numerous, but small and ovoid or oblong, generally in clusters at the top of the stem and branches. Involucral bracts rather broad at the base, ending in a narrow, straight or slightly spreading prickle. Florets pink or whitish. Pappus-hairs simple.—*C. tenuiflorus*, Curt.

Hab.: Europe. Received from Tiaro as a troublesome weed, November, 1900.

p. 887—Line 24 from top, after 64, add Ill. Bot. Cook's Voy. Pl. 168.

p. 889—Line 14 from bottom, after 151, add Ill. Bot. Cook's Voy. Pl. 169.

p. 890—Line 3 from top, after 151, add Ill. Bot. Cook's Voy. Pl. 170A.

p. 890—Line 18 from top, after 335, add Ill. Bot. Cook's Voy. Pl. 170B.

p. 890—Line 33 from top, after 91, add Ill. Bot. Cook's Voy. Pl. 170c.

p. 892—Line 20 from bottom, after 187, add Ill. Bot. Cook's Voy. Pl. 171.

p. 893—Add: 1A. **V. perfoliata** (perfoliate), *R. Br. Prod.* 581; *Benth. Fl. Austr.* iv. 46. Glabrous except a little short wool in the axils of the leaves and bracts. Radical leaves petiolate, obovate or oblong, toothed or entire. Scapes or stems tall, glaucous, dichotomous, with large broad connate entire or toothed bracts at the forks. Flowers shortly pedicellate in the forks, the upper ones in a compact corymb. Sepals 3, orbicular-cordate, about 3 lines long, the two inner ones scarcely smaller than the outer ones. Corolla yellow, about $\frac{3}{4}$ in. long,

glabrous outside, the lower lobes winged, the two upper ones winged on the outer side only, with a concave densely hairy auricle below the wing. Style densely hairy. Capsule shorter than the calyx. Seeds very flat and broad, with a thickish margin not winged.—DC. Prod. vii. 518.

Hab.: Charlotte Plains, *W. A. L. Ivory*.

- p. 893—Line 11 from bottom, after 971, add Ill. Bot. Cook's Voy. Pl. 172.
- p. 894—Line 19 from top, after 518, add Ill. Bot. Cook's Voy. Pl. 178.
- p. 897—Line 3 from bottom, after 28, add Ill. Bot. Cook's Voy. Pl. 174.
- p. 899—Line 3 from bottom, after 145, add Ill. Bot. Cook's Voy. Pl. 175.
- p. 903—Line 3 from bottom, after given), add Ill. Bot. Cook's Voy. Pl. 176.
- p. 904—Line 8 from bottom, after 516, add Ill. Bot. Cook's Voy. Pl. 177A.
- p. 905—Line 25 from top, after 721, add Ill. Bot. Cook's Voy. Pl. 177B.
- p. 909—Line 25 from bottom, after 62, add Ill. Bot. Cook's Voy. Pl. 178.
- p. 917—Line 4 from top, after 364, add Ill. Bot. Cook's Voy. Pl. 179.
- p. 918—Line 17 from top, after 365, add Ill. Bot. Cook's Voy. Pl. 180.
- p. 919—Line 28 from top, after 1896, add Ill. Bot. Cook's Voy. Pl. 181.
- p. 922—Line 18 from bottom, after 244, add *Cervicina gracilis*, Britt. Ill. Bot. Cook's Voy. Pl. 182.

- p. 927—Line 13 from top, after 50, add Ill. Bot. Cook's Voy. Pl. 183.
- p. 933—Line 12 from top, after 42, add Ill. Bot. Cook's Voy. Pl. 185.
- p. 934—Line 26 from top, after 45, add Ill. Bot. Cook's Voy. Pl. 186.
- p. 935—Line 4 from top, after 656, add Ill. Bot. Cook's Voy. Pl. 187.
- p. 935—Line 8 from bottom, after 659, add Ill. Bot. Cook's Voy. Pl. 188.

p. 937—Add. 18A. **L. deformis** (ill-formed), *R. Br. Prod.* 546; *Benth. Fl. Austr.* iv. 221. A straggling plant, with wiry branches like those of *L. virgatus*, and similar foliage. Leaves erect or spreading, linear or linear-lanceolate, tapering into a short point, rigid, concave, finely veined, 2 to 3 lines long. Peduncles axillary, exceedingly short, bearing usually a single flower besides the rudiment. Bracts very small; bracteoles broad, acute, ciliolate, not half so long as the calyx. Sepals $1\frac{1}{2}$ line long, dry acute, minutely ciliolate. Corolla shortly exceeding the calyx, the lobes as long as the tube. Anthers attached about the middle, obtuse, without sterile tips. Hypogynous disk readily separating into obtuse scales. Ovary densely-villous, 3-celled. Style long and slender.—*Styphelia deformis*, Spreng Syst. i. 658.

Hab.: Tallebudgera, *C. J. Gwyther*.

- p. 940—Line 20 from bottom, after 761, add Ill. Bot. Cook's Voy. Pl. 190.
- p. 941—Line 22 from top, after 52, add Ill. Bot. Cook's Voy. Pl. 191.
- p. 949—Line 21 from top, after 96, add Ill. Bot. Cook's Voy. Pl. 192.
- p. 958—Line 6 from bottom, after l.c., add *Sideroxylon Brownii*, F. v. M. Britt. Ill. Bot. Cook's Voy. Pl. 193.
- p. 959—Line 11 from bottom, after name), add *Bail*.
- p. 960—Line 23 from bottom, after 176, add *Benth. Fl. Austr.* iv. 284.
- p. 961—Line 5 from bottom, after 203, add Ill. Bot. Cook's Voy. Pl. 194.
- p. 971—Line 23 from bottom, after 308, add Ill. Bot. Cook's Voy. Pl. 195.

p. 972—Line 18 from top, after 42, add *Mayepea arillaris*, F. v. M.; Brit. Ill. Bot. Cook's Voy. Pl. 197.

p. 974—Line 16 from top, after 287, add Ill. Bot. Cook's Voy. Pl. 196.

p. 977—Line 21 from bottom, for J. read T.

p. 980—Line 21 from bottom, after 346, add *Gynopogon spicatum*, Britt. Bot. Cook's Voy. Pl. 198.

p. 984—Line 12 from bottom, for *ocellatus* read *ocellatus*.

p. 992—Line 14 from top, after 634, add Ill. Bot. Cook's Voy. Pl. 199.

p. 994—Add: 4. **W. pubescens** (pubescent), *R. Br. Prod.* 467; *Benth. Fl. Austr.* iv. 316. A tall shrub or small tree, the foliage and inflorescence more or less pubescent or velvety-tomentose. Leaves shortly petiolate, ovate or elliptical-oblong, acuminate, the primary veins rather distant and prominent underneath, 2 to 4 in. long. Flowers white, sessile or shortly pedicellate in terminal trichotomous corymbose cymes not exceeding the leaves. Calyx-segments broadly ovate, almost orbicular, nearly 2 lines long, with 1 or 2 ovate scales inside at the base of each. Corolla-tube broad, scarcely exceeding the calyx, contracted at the throat; lobes twice as long as the tube, the left-hand edges overlapping in the bud. Corona of 10 erect scales, 5 larger ones alternating with the stamens irregularly several-toothed, 5 smaller behind the stamens 2-toothed. Anthers in a cone of above 3 lines. Carpels of the ovary connate or coherent at the base, distinct at the top; stigma dilated and membranous at the base, with 2 linear lobes. Fruit hard, about 6 in. long, the follicles not separating until maturity.—*A. DC. Prod.* viii. 405.

Var. *penicillata*. "Cherite," Mapoon, *Roth*. This variety seems only to differ from the type in the following particulars. It's leaves being from oval-oblong to oblong-lanceolate, 3 to 6 in. long, and from $1\frac{1}{2}$ to 2 in. broad. Bracts about 1 line long, with thick midrib. Pedicels 4 to 6 lines long. Lobes of the corona penicillate. Follicles from 5 to 8 in. long, tapering much towards the apex, lenticels conspicuous. Seeds fusiform, about 7 lines long, coma white, longer or of equal length.

Hab.: Mapoon, *J. F. Bailey*.

Bark used for twine.

p. 1001—Line 11 from bottom, after 529, add Ill. Bot. Cook's Voy. Pl. 201.

p. 1002—Line 11 from bottom, after 64, add Ill. Bot. Cook's Voy. Pl. 200.

p. 1013—Line 8 from top, after 5820, add Ill. Bot. Cook's Voy. Pl. 203.

p. 1014—Line 3 from top, after 632, add Ill. Bot. Cook's Voy. Pl. 202.

p. 1018—Line 7 from top, after 104, add Ill. Bot. Cook's Voy. Pl. 204.

p. 1018—Line 11 from bottom, after 12, add Ill. Bot. Cook's Voy. Pl. 205.

p. 1019—Line 4 from top, after 131, add Ill. Bot. Cook's Voy. Pl. 206.

p. 1019—Line 20 from bottom, after 11, add Ill. Bot. Cook's Voy. Pl. 207.

p. 1020—Line 7 from top, after 11, add Ill. Bot. Cook's Voy. Pl. 208a.

p. 1020—Line 22 from bottom, after 10, add Ill. Bot. Cook's Voy. Pl. 208b.

p. 1027—Line 19 from bottom, after 63, add Ill. Bot. Cook's Voy. Pl. 209.

p. 1042—Line 15 from top, after 95, add Ill. Bot. Cook's Voy. Pl. 210.

p. 1048—Line 6 from top, after 30, add *Borriginoides zeylanica*, Hiern; Britt. Ill. Bot. Cook's Voy. Pl. 211.

p. 1059—Line 8 from top, after 341, add Ill. Bot. Cook's Voy. Pl. 213.

p. 1060—Line 12 from bottom, after 198, add "Endabari," Batavia River, *Roth*.

p. 1031—Line 3 from top, after 50, add Ill. Bot. Cook's Voy. Pl. 212.

p. 1065—Line 25 from top, after 425, add “Kon-yara,” Middle Palmer River, Roth.

p. 1065—Line 4 from bottom, after 55, add *Merremia hastata*, Hallier; Britt. Ill. Bot. Cook's Voy. Pl. 214.

p. 1066—Line 22 from top, after 426, add “Kand-ja,” Cooktown, Roth.

p. 1069—Line 18 from top, after 601, add *L. Fitzalani*, F. v. M.; Britt. Ill. Bot. Cook's Voy. Pl. 215.

p. 1069—Line 6 from bottom, for “interesting” read “entwining.”

p. 1070—Line 17 from bottom, after valves, add *Jacquemontia multivalvis*, Hallier; Britt. Ill. Bot. Cook's Voy. Pl. 216.

p. 1102—Line 18 from top, after 440, add Ill. Bot. Cook's Voy. Pl. 217.

p. 1104—Line 21 from top, after 8, add Ill. Bot. Cook's Voy. Pl. 218.

p. 1111—Line 3 from bottom, after 141, add Ill. Bot. Cook's Voy. Pl. 219.

p. 1119—Line 20 from top, after 495, add Ill. Bot. Cook's Voy. Pl. 221.

p. 1122—Line 21 from bottom, after 99, add *Razumovia hispida*, Britt. Ill. Bot. Cook's Voy. Pl. 220.

p. 1126—Line 9 from bottom, after 15, add Ill. Bot. Cook's Voy. Pl. 222B.

p. 1127—Line 3 from top, after 16, add Ill. Bot. Cook's Voy. Pl. 222A.

p. 1127—Line 18 from top, after 18, add Ill. Bot. Cook's Voy. Pl. 223A.

p. 1127—Add: 7A. **U. flava** (yellow), *Banks and Sol. in R. Br. Prod.* 492; *Britt. Ill. Bot. Cook's Voy. Pl.* 223B. Annual, with fibrous roots, the rootstock shortly creeping. Leaves few, rather distant, linear-lanceolate, acute, quite entire, flat, about 2 lines long. Scape erect, filiform, slender, terete. Flowers 3 to 10, remote. Bracts subulate from a broad base. Calyx-segments 2, ovate-oblong, yellowish-red, $1\frac{1}{2}$ line long. Corolla monopetalous ringent, yellow, upper-lip oblong, the apex slightly bifid, lobes roundly obtuse, lower-lip almost twice as long and four times as broad, 8-lobed, lateral lobes oblong, obtuse, middle lobe roundly ovate. Filaments 2, filiform, flat. Anthers roundish, small, straw-coloured. Style flat and somewhat thick. Ovary roundly ovate. Capsule subglobose, 1-celled. Seeds numerous.

Given as a form of *U. chrysanthia* at page 1127; raised to specific rank by Britt. l.c.

7B. **U. barbata** (bearded), *R. Br. Prod.* 492; *Britt. Ill. Bot. Cook's Voy. Pl.* 224. Annual, root fibrous. Leaves few or wanting, elliptic-lanceolate, quite entire, about 2 lines long. Scape erect, about 7 in. high, filiform, terete. Flowers 3 to 8, remote. Bracts ovate, acute. Calyx diphyllous. Corolla monopetalous ringent, yellow, upper lip ovate-oblong, lower lip much smaller than the upper, 8-lobed, gibbose at the base, the throat villous inside. Filaments 2. Anthers oblong, connivent, yellow. Ovary ovate. Style somewhat flat. Capsule globose, 1-celled. Seeds numerous.—*Ex Britt. l.c.*

Hab.: Endeavour River.

Britten l.c. gives the following as the principal distinctive characters by which the three following species are separated.—

U. flava. Intermediate lobe of lower-lip entire.

U. barbata. Upper-lip emarginate, intermediate lobe of the lower-lip bilobed; spur subulate.

U. chrysanthia. Upper-lip bifid, intermediate lobe of lower-lip bipartite; spur subulate-conical.

- p. 1127—Line 5 from bottom, after Vahl., add Ill. Bot. Cook's Voy. Pl. 225.
 p. 1128—Line 5 from bottom, after 24, add Ill. Bot. Cook's Voy. Pl. 226A.
 p. 1129—Line 9 from top, after 24, add Ill. Bot. Cook's Voy. Pl. 226B.
 p. 1129—Line 22 from top, after 15, add Ill. Bot. Cook's Voy. Pl. 227, A, B, and 222c.

p. 1130—Add: 2. **Orobanche**, *Sp.* Stem about 15in. high, erect, fistular, of a bright purple colour, shining through white glandular hairs; the rhachis or flower-bearing portion twice as long as the flowerless part or peduncle. The peduncle bearing near the base a few lanceolate bracts about $\frac{3}{4}$ in. long; bracts subtending the flowers with elongated recurved points, woolly-hairy outside, glabrous inside and showing numerous parallel nerves. Sepals 2, hairy, nearly the length of the corolla-tube, the base ovate, the sides elongating into filiform points, often irregular as to length, and sometimes purplish. Corolla hairy, somewhat campanulate, slightly curved, tube about $\frac{3}{4}$ in. long, purple-lined, lobes rather short but broad, white marked on the face with purplish-branched lines, margins undulate with fringed edges. Stamens hairy. Filaments 2 slender, 2 rather broad towards the base, attached to the corolla-tube, somewhat distant from its base, shorter than the corolla-tube. Anthers dark-coloured. Style hairy. Stigma rather large, light to dark-brown, 2-lobed, lobes spreading.

Hab.: On roots of Sweet Peas growing in Mr. C. C. Mitchell's garden, South Brisbane (Nov. 1902).

There are supposed to be over 100 good species of this genus; of fully a third I have not the descriptions to consult, and as I do not consider the present species to agree with any of which I have descriptions I prefer publishing it without specific name.

- p. 1134—Line 25 from bottom, after 865, add Ill. Bot. Cook's Voy. Pl. 228.
 p. 1137—Line 24 from bottom, after 72, add Ill. Bot. Cook's Voy. Pl. 229.
 p. 1140—Line 15 from top, after 106, add Ill. Bot. Cook's Voy. Pl. 230.
 p. 1142—Line 5 from bottom, after 67, add Ill. Bot. Cook's Voy. Pl. 231.
 p. 1143—Line 3 from bottom, after 91, add Ill. Bot. Cook's Voy. Pl. 232.
 p. 1147—Line 20 from bottom, after 456, add Ill. Bot. Cook's Voy. Pl. 235.
 p. 1151—Line 23 from top, for *abscendens* read *adscendens*.
 p. 1151—Line 25 from top, after l.c., add Ill. Bot. Cook's Voy. Pl. 233 and 234.
 p. 1151—Line 22 from bottom, for T. read J.
 p. 1155—Line 6 from top, after larger, add Ill. Bot. Cook's Voy. Pl. 236.
 p. 1174—Line 21 from bottom, after Lam., add Ill. Bot. Cook's Voy. Pl. 237.
 p. 1178—Line 15 from top, after 189, add Ill. Bot. Cook's Voy. Pl. 238.
 p. 1181—Line 24 from top, after corky, add Bot. Mag. 7187.
 p. 1184—Line 9 from top, after 671, add *Siphonanthus floribundus*, Britt. Ill. Bot. Cook's Voy. Pl. 239.
 p. 1190—Line 22 from bottom, after 67, add *Germanea australis*, Britt. Ill. Bot. Cook's Voy. Pl. 240.

p. 1198—Add :

15A. ***LAMIUM**, Linn.

(The name used by Pliny, supposed from *laimos*, a throat.)

Calyx 5-nerved; teeth 5, equal or the upper longer. Corolla-tube annulate or not within, throat dilated; upper lip arched; lower spreading, 8-lobed, middle lobe broad, contracted at the base. Stamens 4; anthers connivent; cells diverging. Style lobes subulate. Nuts triquetrous, truncate, smooth, scaly or tuberculate. Annual or perennial hairy herbs. Whorls axillary, many-flowered or in leafy heads, bracteoles none or subulate.

The species are met with in Europe, temperate Asia and Northern Africa. The Queensland species is an introduction.

1. **L. amplexicaule** (stem-clasping), *Linn. Hook. Fl. Brit. Ind.* iv. 679. Henbit Nettle. Annual, leaves orbicular inciso-crenate, hairy or glabrous, $\frac{1}{4}$ to $\frac{3}{4}$ in. diameter, the lower ones long-petiolate, almost lobulate, the base rounded or cordate, the floral ones sessile and broader than long. Flowers in distant whorls. Calyx small pubescent, teeth equalling the tube converging in fruit. Corolla-tube long slender nearly straight, purple.

Hab.: Killarney, *Jos. Wedd.* Most probably naturalized.

Found in Europe, Asia and Northern Africa.

p. 1206—Line 5 from top, after 214, add *Ill. Bot. Cook's Voy. Pl.* 242.

p. 1209—Line 26 from bottom, after 602, add *Ill. Bot. Cook's Voy. Pl.* 243.

p. 1216—Add: 1A. **D. plantaginella** (like a small *Plantago*), *F. v. M. Fragm.* i. 61; *Benth. Fl. Austr.* v. 164. An erect branching annual of 1 to 8 in., slightly glandular-hairy. Stem leaves in the lower part of the plant petiolate, ovate or obovate, obtuse, entire, 2 to 4 lines long. Flowers resembling those of *D. littoralis*, but the clusters crowded in dense terminal cylindrical leafless spikes of 1 to 2 in. or more, and consequently occupying the greater portion of the plant. Perianth of 8 obovate-clavate concave segments, about $\frac{1}{4}$ line long, and falling off with the fruit. Style very deciduous.

Hab.: Bulgroo, *J. J. McIver.*

p. 1230—Add: 16. **T. leucocoma** (alluding to the white hairs of the inflorescence), *Moq. in DC. Prod.* xiii. ii. 292; *Benth. Fl. Austr.* v. 238. A plant about 6 in. high, stems erect or ascending, slightly branched, glabrous or nearly so. Leaves linear, scarcely exceeding 1 in. long. Spikes at first globular, at length oblong, $\frac{1}{2}$ to $\frac{3}{4}$ in. long. Bracteoles broad obtuse or with small points, thin and shining, 1 to $1\frac{1}{2}$ line long; bracts usually not so broad and more pointed and often shorter. Perianth about $2\frac{1}{2}$ lines long, the tube rather thick, $\frac{1}{4}$ line long, the segments rigid with scarious margins, the dorsal hairs not so dense nor so long as in any other species, the tips shortly glabrous truncate and denticulate in the outer segments, more acute but not shorter in the inner ones, all glabrous inside. Staminal cup shortly free near the base of the perianth-tube, surrounded by woolly hairs; filaments scarcely dilated. Ovary glabrous.

Hab.: Bulloo River border of N S.W., *D. W. F. Halton* (*J. H. Maiden*).

p. 1802—On Plate LIV. transpose the numbers 8 and 4 at the figures.

p. 1826—Line 4 from bottom, for *Cyanscarpus* read *Cyanocarpus*.

p. 1843—Line 9 from top, for in. read line

p. 1851—Bottom line, for amina read lamina.

p. 1369—For *Wickstroemia* read *Wikstroemia*.

p. 1385—Line 25, for natives read native.

p. 1428—Line 22, for style read styles.

p. 1449—Add to description of: 9. **Mallotus discolor**. Female racemes slender, shorter than the males. Flowers rather distant and few. Pedicels slender, about 1 line long, often recurved. Perianth-segments recurved. Styles or stigmatic-lobes 3 or more densely fringed. Capsule depressed-globular, 4 lines diameter, clothed outside with minute globular yellow glands, 4-celled. Seeds nearly globular.

p. 1469—Line 24 from bottom, after *Roth.*, add "*Dortalama*," Batavia River, *Roth.*

p. 1484—Line 8 from top, after *Herb.*, add *Bot. Mag. t. 7057*.

p. 1505—Line 19 for dilly-bay read dilly-bag.

p. 1507—Line 7, for T read F.

p. 1551—Line 23 from top, after 1, add *Bot. Mag. t. 7010*.

p. 1554—Add: 11. **S. Newportii** (after Howard Newport), *Bail.* Stem slender, creeping amongst moss; the apical portion received 2in. long, more or less clothed with scarious leafsheaths. Leaves narrow-oblong, shortly tapering at both ends, the base infolded and forming above the sheath a pseudo-petiole; midrib forming a sharp keel on the underside and a corresponding depression on the face, longitudinal nerves numerous and prominent in the dried specimen. Racemes 2in. long, in the axils of the lower leaves, reddish, erect, slender and rigid, the upper portion bearing about 7 pinkish flowers. Pedicels filiform, 2 lines or with ovary 3 lines long. Sepals broad lanceolate, about 8 lines long, pinkish, with 3 longitudinal darker-coloured lines. Petals shorter and narrower than the sepals, with 1 middle line which is thickened near the apex. Labellum about the length of the sepals, lateral lobes pink, small, more or less hairy, ending in almost capillary points, middle lobe yellow, more or less hairy on the face, elongated and almost rodlike. Column rather short, the basal projection to which the labellum is attached rather slender and much incurved; wings ending in rather long points which are at times toothed in the lower part. Anther white velvety, the front margin ciliate. Pollen-masses of the flowers examined imperfect, but the pollen appeared to be somewhat mealy.

Hab.: Mt. Alexandra, *Howard Newport*.

p. 1555—Line 12 from bottom, the last letter, for e read a

p. 1608—Line 21 from bottom, for pedunculata read pedunculatum.

p. 1610—Line 24 from bottom, for confirtum read confertum.

p. 1618—Line 18, for plants read plant's.

p. 1619—Line 11 from top, for Sowerbya read Sowerbæa.

p. 1665—Line 25 from top, after *Shirley*, add "*Kwanja*," Middle Palmer River, "*An-ga-tan*," "*Barnka*," Princess Charlotte Bay, "*Pungga*," Cape Bedford, and "*Ngang-ir*," Cooktown, *Roth*.

p. 1679—Line 5 from bottom, after 136, add *Bot. Mag. t. 6644*,

- p. 1681—Line 28 from bottom, for *fruticans* read *fruticans*.
- p. 1745—Line 16 from top, for *littoralis* read *littoralis*.
- p. 1747—Line 12 from bottom, for *sanguineofucus* read *sanguineofuscus*.
- p. 1754, 5, 6—Running subhead for *Kyllinga* read *Heleocharis*.
- p. 1761—Line 10 from bottom, for *schoenoides* read *schœnoides*.
- p. 1777—Line 4 from bottom, after 342, add "Chakata," Cape Grafton, *Roth*.
- p. 1811—Line 11, for *Phragmitis* read *Phragmites*.
- p. 1812—Line 28 from top, for *spiklets* read *spikelets*.
- p. 1836—Line 9 from bottom, after Grass, add "Lo-thi," Batavia River, *Roth*.
- p. 1861—Line 1, for *Eionurus* read *Elionurus*.
- p. 1884—Line 21 from top, after hairy, add Maid. Agri. Gaz. N.S.W. xii.
- p. 1900—Line 25 from bottom, after 200, add Bail. Ill. Mono. Ql. Gr. i.
- p. 2010—First line, for *arillaris*, read *axillaris*.

p. 718—Add : 7. **T. geraniifolia** (*Geranium* leaved), *Bail*. Stem spongy, stout. Leaves crowded at the apex of stem or branch, strigose on both sides, rotund-cordate, palmately 5 to 7-nerved, about $1\frac{1}{2}$ in. long and $2\frac{1}{4}$ in. broad, the base truncate or with a very wide sinus, the margin 7-lobed; lobes short, broad, and toothed; petioles from $2\frac{1}{2}$ to $3\frac{1}{2}$ in. long, rather slender, slightly expanding at the base, ferruginous hairy. No stipules. Peduncle terminal, about 7 in. long, erect, hairy, somewhat flattened; primary umbel 5-rayed. Involucre of 5 lacinate bracts, 4 to 5 lines long; secondary involucre like the first but smaller, mostly with fewer rays each bearing an umbel of small white polygamous flowers; involucels of about 10, narrow, linear, filiform-pointed, bracteoles with prominent midrib. Flowers numerous, pedicels of the male filiform, $2\frac{1}{2}$ lines long, those on the perfect flowers shorter. Calyx-teeth minute. Petals oblong. Stamens 5. Fruits (only a few very young ones seen) of 2-carpels, ribbed, otherwise smooth.

Hab.: Mt. Alexandra, *Howard Newport*.

INDEX OF GENERA AND SPECIES.

The synonyms and species incidentally mentioned are printed in italics.

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<i>fusca</i> , F. v. M.	.. 1766	<i>laziflora</i> , Rich.	.. 1882	<i>affinis</i> , R. Br.	.. 1863
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<i>schanoides</i> , R. Br.	.. 1761	<i>ovata</i> , Forst.	... 1879	<i>annulatus</i> , F. v. M.	.. 1863
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<i>alcicorne</i> , Sw.	.. 1995	<i>Solandri</i> , F. v. M.	... 1883	<i>exaltatus</i> , R. Br.	.. 1864
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<i>fraxinifolium</i> , R. Br.	.. 1994	<i>lævis</i> , Spreng.	.. 1886	<i>intermedius</i> , R. Br.	.. 1864
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<i>scandens</i> , J. Sm.	.. 1993	<i>polygynum</i> , R. Br.	.. 1719	<i>montanus</i> , Roxb.	.. 1867
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<i>crinita</i> , R. Br.	.. 1884	<i>Brownei</i> , F. v. M.	.. 1879	<i>australis</i> , R. Br.	.. 1870
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<i>cuspidata</i> , Anders. . .	1870	<i>affine</i> Sw. . .	1971	<i>Borraginoides</i> . . .	
<i>frondosa</i> , R. Br. . .	1871	<i>attenuatum</i> , R. Br. . .	1969	<i>Zeylanica</i> , Hern. . .	2010
<i>membranacea</i> , Lindl. . .	1872	<i>australasicum</i> , Hook. . .	1969	<i>Botrychium</i> . . .	1932
<i>Anthosachne</i> . . .		<i>australe</i> , Brack. . .	1972	<i>australe</i> , R. Br. . .	1933
<i>australasica</i> , Steud. . .	1921	<i>Brownii</i> , J. Sm. . .	1972	<i>ternatum</i> , Sw. . .	1933
<i>Anthoxanthum</i> . . .		<i>bulbiferum</i> , Forst. . .	1972	<i>virginianum</i> , Hook. f. . .	1933
<i>crinitum</i> , Linn. f. . .	1884	<i>caudatum</i> , Forst. . .	1970	<i>Briza</i> . . .	1914
<i>Antrophyum</i> . . .	1992	<i>decussatum</i> , Sw. . .	1974	<i>maxima</i> , Linn. . .	1914
<i>plantagineum</i> , Kaulf. . .	1992	<i>falcatum</i> , Lam. . .	1970	<i>minor</i> , Linn. . .	1914
<i>reticulatum</i> , Kaulf. . .	1992	<i>flabellifolium</i> , Cav. . .	1969	<i>virens</i> , Linn. . .	1914
<i>Apluda</i> . . .	1857	<i>flaccidum</i> , Forst. . .	1972	<i>Bromidium</i> . . .	
<i>mutica</i> , Linn. . .	1857	<i>furcatum</i> , Thunb. . .	1971	<i>lobatum</i> , Nees . . .	1884
<i>Aponogeton</i> . . .	1707	<i>Hookerianum</i> , Colens. . .	1971	<i>quadrisetum</i> , Nees . . .	1884
<i>elongatum</i> , F. v. M. . .	1708	<i>japonicum</i> , Thunb. . .	1973	<i>Bromus</i> . . .	1918
<i>monostachyus</i> , Linn. f. . .	1707	<i>laserpitiifolium</i> , Lam. . .	1972	<i>arenarius</i> , Labill. . .	1918
<i>Arctium</i> . . .	2007	<i>laxum</i> , R. Br. . .	1972	<i>australis</i> , R. Br. . .	1918
<i>Lappa</i> , Linn. . .	2008	<i>lucidum</i> , Forst. . .	1971	<i>sterilis</i> , Linn. . .	1918
<i>Aristida</i> . . .	1873	<i>maximum</i> , G. Don. . .	1973	<i>uniloides</i> , H. B. K. . .	1918
<i>adscensionis</i> , Linn. . .	1875	<i>nidus</i> , Linn. . .	1962	<i>Willdenowii</i> , Kunth. . .	1918
<i>arenaria</i> , Gaudich. . .	1874	<i>obliquum</i> , Forst. . .	1971	<i>Butomopsis</i> . . .	1704
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<i>contorta</i> , F. v. M. . .	1874	<i>paleaceum</i> , R. Br. . .	1970	<i>lanceolatus</i> , Roxb. . .	1704
<i>depressa</i> , Retz. . .	1875	<i>physosorus</i> , Sieb. . .	1972	<i>Butonica</i> . . .	
<i>hygrometrica</i> , R. Br. . .	1873	<i>polypodioides</i> , Metten. . .	1973	<i>calyptata</i> , Miers . . .	2005
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<i>Arthraxon</i> . . .	1856	<i>argutus</i> , R. Br. . .	2007	<i>enneusperma</i> , Kuntze . . .	1997
<i>ciliare</i> , Beauv. . .	1857	<i>Astrebula</i> . . .	1896	<i>filiformis</i> , Kuntze . . .	1997
<i>Arthropteris</i> . . .		<i>pectinata</i> , F. v. M. . .	1896	<i>Callipteris</i> . . .	
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